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GOLD CHLORIDE AND SILVER NITRATE AS TESTS FOR FIXED OILS.

By Frank X. Mœrk, Ph. G.

A Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.

Read at the Pharmaceutical Meeting, January 15th.

In the *Pharm. Ztschr. f. Russl.*, 1888, 721 (Am. Journ. Pharm., 1889, 23), E. Hirschsohn gives as a reliable and easily applied test for the detection of cotton-seed oil the behavior of this oil towards a chloroformic solution of gold chloride (1 gm. to 200 cc.), and asserts that it will indicate *one per cent*, in admixture with olive oil. The procedure is to take 5 cc. of the oil with 10 drops of the gold chloride solution and heat for twenty minutes by placing the test tube in a vessel containing boiling water, a red color indicating the presence of cotton-seed oil. With a view of confirming this apparently valuable test numerous samples of commercial oils were obtained, on which, however, little reliance for purity could be placed; from Mr. Geo. M. Behringer were received samples which he believed to be pure, based upon confidence placed in the producer as well as upon tests made with the samples; other samples were gotten in the chemical laboratory by means of solvents.

Before giving the results in detail it may be well to state that the test which Hirschsohn claims as so characteristic for cotton-seed oil was also obtained with the oils of arachis, ben, poppy (an imported oil), sesame and walnut kernel. To ascertain if these oils were contaminated with cotton-seed oil, or probably contained a common principle, their effect upon silver nitrate solution was tried, using the method of O. Hehner (*Analyst*, September, 1888, and Am. Journ.

PHARMACY, 1888, 575), 1 gm. silver nitrate, 200 cc. alcohol, 40 cc. ether, 0·1 gm. nitric acid; the oil with half its volume of this solution was kept in a water-bath at 100° for fifteen minutes, noticing the effect produced in this time. It was found that some fixed oils which could not be identified at the end of this time could be distinguished by heating for one hour in the same way, noticing the effect, and then cooling by placing in a vessel of cold water. The prolonged heating had, in addition to the color imparted, the effect of rendering most of the oils more viscid, while some of them became almost, others quite solid. The oils giving the red color with gold chloride behaved differentlywith silver nitrate, indicating that they were not identical.

For comparison the oils examined are divided into three groups: 1, *pure oils;* 2, commercial oils corresponding to those of group 1; 3, commercial oils of which no *reliable* specimens were examined, and hence cannot be commented upon.

In giving the results of the reagents with $AuCl_3$, the time of observation was twenty minutes, if a color appeared sooner, the time is given; with silver nitrate, *a* indicates the effect in fifteen minutes, *b* in one hour.

1. Pure Oils.	$AuCl_3$.	$AgNO_3$.
Almond	No change.	*a*, light brown; *b*, red color.
Arachis	Red in 3 minutes.	*a*, dark red color; *b*, dark gray green, almost solid.
Ben	" " 5 "	*a*, no change; *b*, brownish.
Burdock fruit	Precipitate of met. gold.	*a*, green brown, precipitate.; *b*, very dark brown.
Corn	" " " "	*a*, dark red color; *b*, precipitate.
Cotton-seed 1	Red in 5 minutes.	*a*, gray green, ppt.; *b*
" " 2	" " 3 "	*a*, " " " *b*
" " 3	" " 5 "	*a*, " " " *b* — no change.
" " 4	" " 4 "	*a*, dark " " *b*
" " 5	" " 3 "	*a*, gray " " *b*
Hemp-seed (dark)	Indistinct dark color.	*a*, dark green color; *b*, no change.
Lard	No change.	*a*, no change; *b*, gray black, ppt.
Mustard	" "	*a*, green black, ppt.; *b*, no change.
Olive, Mottet, (4 years old)	" "	
" " (6 mos. old)	" "	*a*, greenish, slight ppt.; *b*, no change.
" Lucca	" "	
" Kimball	Slight precipitate of Au.	*a*, greenish; *b*, solid.
Peach-kernel	No change.	*a*, light brown; *b*, gray black, ppt.
Poppy-seed (imported)	Red in 3 minutes.	*a*, light brown; *b*, solid.
" " 2. (fresh)	Precipitate of met. gold.	*a*, dark brown; *b*, ppt. — remain liquid.
" " 3. (old)	" " " "	*a*, black, ppt.; *b*, dark brown, ppt. — remain liquid.
Rape	No change.	*a*, dark green; *b*, ppt.
Sesame	" "	*a*, green black, ppt.; *b*, no change.
Sophora	" "	*a*, light brown, ppt.; *b*, dark green, ppt.
Sun-flower	" "	*a*, greenish; *b*, dark red brown.
Walnut-kernel, American.	Red in 2 minutes.	*a*, brown color; *b*, green black, ppt.

It will be seen that most of the oils give dark colorations or precipitates with silver nitrate, so that this test can not be used to indicate

positively the presence of cotton-seed oil; there is, however, with cotton-seed oil always a grayish film separated on the sides of the test tube, with mustard and rape oils a film is formed which is of a black color, the color being due possibly in the first case to metallic silver, in the second case to sulphide of silver.

Arachis oil with silver nitrate develops in a few minutes a red color which then passes into a dark brown in the course of fifteen minutes; this test is apparently characteristic for arachis oil among the vegetable oils but is also given by some of the fish oils.

Cotton-seed oils may differ in the rapidity with which they react with both $Au\ Cl_3$ and $Ag\ NO_3$, this no doubt being due to the manner and completeness of the purification of the oil by chemicals; there is also a difference in their behavior to sulphuric acid. To ascertain something of the nature of the body giving the reaction with $Au\ Cl_3$, a portion of cotton-seed oil was mixed with alcohol and some pieces of potassium hydrate; after shaking a few minutes a clear solution was obtained which was poured off from the undissolved potassium hydrate into a large volume of water; by this means the unsaponified oil was again separated, the soap remaining in solution; the separated oil was now saponified and from the two soap solutions were precipitated the fatty acids. The acid obtained from the easily saponified portion of the oil contained a liquid and a solid portion which could be separated by cooling the mixture; with $Au\ Cl_3$ a very fine red coloration was produced; the acid from the more difficultly saponified portion of the oil was solid and gave only a momentary red color, changing into a violet and depositing a dark precipitate. The cause of the red color is hence to be found in the liquid acid.

2. Commercial Oils.

	$Au\ Cl_3$.	$Ag\ NO_3$.
Almond 1	Red in 5 minutes.	Red color, *a*, dark; *b*, very thick.
" 2	No change.	*a*, pale brownish; *b*, gray black, ppe.
Arachis	Red in 3 minutes.	Red color, *a*, dark; *b*, brown black, solid.
Lard 1	No change.	*a*, no change; *b*, brownish black, precipitate.
" 2	" "	*a*, no change; *b*, gray black, ppe.
Mustard	" "	*a*, dark, ppe; *b*, dark green, ppe.
Olive 1 (green)	Red in 3 minutes.	*a*, pale brown; *b*, dark red brown.
" 2	No change.	*a*, greenish; *b*, solid.
" 3	Red in 3 minutes.	*a*, gray green. ppe.; *b*, no change.
Poppy-seed	" " 3 "	*a*, pale brown; *b*, pale yellow, solid.
Rape	No change.	*a*, dark green, ppe.; *b*, no change.
Salad	Red in 3 minutes.	Red color, *a*, green, ppe.; *b*, gray black, thick.

Attention should be called to the difference between the poppy-seed oils; No. 1 is an imported oil, Nos. 2 and 3 were made from black poppy-seed by expression. The difference is so great that the oils were possibly made from different kinds of seed, the imported probably from white poppy-seeds.

Regarding these oils, some show adulteration: Almond, 1 with arachis oil; almond, 2 with peach-kernel oil; olive 1, the adulterant possibly a mixture; olive 3, with cotton-seed oil; salad, a mixture of arachis and sesame oils.

3. Commercial Oils.

	$AuCl_3$.	$AgNO_3$.
Castor 1	Slight precipitate of gold.	*a*, reddish; *b*, fluorescent, dark red, thick.
" 2	No change.	*a*, reddish; *b*, fluorescent, dark red, thick.
Croton	" "	*a*, no change; *b*, dark green, solid.
Cod liver 1	Red in 4 minutes.	*a*, dark brown; *b*, no change.
" 2	Slight precipitate of gold.	*a*, pale red; *b*, gray brown.
Fish (good sample)	Dark red in 20 minutes.	*a*, dark red; *b*, no change.
Neatsfoot 1	Red in 12 minutes.	*a*, greenish; *b*, solid.
" 2	No change.	*a*, yellowish; *b*, brownish, solid.
Linseed 1 (cold pressed)	" "	*a*, brown color; *b*, gray black, precipitate, thick.
" 2	Red in 3 minutes.	*a*, red brown; *b*, dark brown, thick.
" 3	No change.	*a*, no change; *b*, yel. green, ppt. "
" 4	" "	*a*, " " *b*, greenish, ppt. "
Sperm 1	Red in 5 minutes.	*a*, brown; *b*, no change.
" 2	No change.	*a*, light brown; *b*, green black, ppt.

Finally a few mixtures of olive and cotton-seed oils were made containing one, five and ten per cent. of the latter oil and subjected to the gold chloride test; the ten per cent. mixture gave on warming for 12 minutes a red color, very distinctly; the five per cent. mixture did not react in twenty minutes but if heated for one-half hour slowly deposited a precipitate of metallic gold; the one per cent. mixture showed no color whatever with gold chloride but with silver nitrate gave a slight deposit on the sides of the test tube. The separation of metallic gold by a number of the oils is probably traceable to the amount of reducing acid present being insufficient to give the red color.

Aqua chloroformi has not only antiseptic and anæsthetic properties (Am. Jour. Phar., 1888, pp. 408, 475), but according to Ullrich (*Prag. Med. Wochenschr.*, 1888, No. 33), is also an effective hæmostatic, very useful in bleeding from the gums after the extraction of teeth.

ON SOME DRUG CONSTITUENTS.

Abstracts from Theses.

Chamomile Flowers.—On exhausting the flower heads of Anthemis nobilis with petroleum benzin, Ella Amerman, Ph. G., obtained a green wax, which after six recrystallizations from alcohol was nearly white, bitter and crystalline, and melted at about 130° C. On exhausting the drug now with ether, and treating this extract again with ether, as recommended by Camboulises in 1871, a crystalline substance, distinctly acid, and of a glucosidal nature was obtained. A small quantity of similar crystals was also obtained by Werner's process (1867) by exhausting with dilute acetic acid, concentrating, precipitating with alcohol, treating with chloroform, evaporating, exhausting with ether and treating this extract with warm distilled water. In a third experiment the alcoholic tincture of the flowers was concentrated, precipitated by water, the filtrate treated with chloroform, the solvent evaporated and the residue treated with water. The aqueous solution of the crystals, on being boiled with hydrochloric acid, became opalescent, emitted a honey-like odor, and with Fehling's solution now gave evidence of the presence of glucose. There was no evidence of the presence of an alkaloid.

Diospyros virginiana, Lin.—The bark of this tree is of a tan color, and has a mucilaginous bitterish, then sweetish and astringent taste. Experiments made by Frank E. Murphy, Ph. G., gave the following results: The powdered bark yielded to petroleum benzin 0·9 per cent. of an amber colored extract, free from volatile oil. Ether took up 1·4 per cent., the extract yielding to alcohol a wine colored mass, which deposited from chloroform in stellate or granular crystals. The alcohol extract of the bark amounted to 2·5 per cent. and was partly soluble in water. The water extract weighed 12 per cent. and contained mucilage and dextrin. The extracts thus far obtained yielded a purple color with alkalies, the reaction being due to yellow coloring matter. On treating the exhausted bark with weak solution of soda, the mixture also acquired a deep purple color, and ultimately became gelatinous. The acid infusion of the residuary bark gave with ammonia a purple colored precipitate; calcium oxalate was not found.

A quantity of the partially ripe fruit was dried and treated with

ether; on evaporating the solvent a granular extract was left, which became purple by alkalies from the presence of yellow coloring matter.

Eriodictyon californicum, Bentham.—An analysis of the leaves yielded to Oliver F. Lenhardt, Ph. G., 7·6 per cent. of moisture, and 4·25 per cent. (or for the anhydrous drug 5·14 per cent.) of ash. Of the latter 26·66 per cent. was soluble in water, 63·4 per cent. soluble in HCl, and 3·5 per cent. soluble in solution of KHO. Petroleum benzin extracted, including volatile oil, 2·63 per cent., of which ·39 was wax which separated from hot alcohol amorphous and melted at 61°C. With ether 15·3 per cent. of extract was obtained, of which three-fifths (9 per cent.) was a brittle, fragrant, and slightly acid resin soluble in 80 per cent. alcohol; a little tannin was also present, and the green tenacious residue was partly soluble in benzol, and entirely soluble in carbon disulphide, and in chloroform; alkaloids and glucosides were absent. The exhausted leaves yielded to absolute alcohol 3·64 per cent. of extract, fully one-third of which was soluble in water, among other constituents tannin and a glucosidal compound being dissolved. The watery extract of the exhausted leaves weighed 22·3 per cent., was of a brown color, had a pleasantly sweetish and somewhat acrid taste, and contained tannin.

Lycopus virginicus, Lin.—Sherman F. Hennessy, Ph. G., experimented with air dry bugle weed, containing 9 per cent. of moisture. Cold water dissolved 10·4 per cent. of constituents, consisting of albuminoids, gummy matter, a little tannin, and extractive. Alcohol now took up 12·8 per cent. of chlorophyll, resin, bitter extractive, etc. A small quantity of a lemon-yellow volatile oil was obtained by distilling the herb with water.

Stigmata Maydis.—John Rea, Ph. G., determined in the cold water infusion of corn silk (fresh?) the sugar by means of Fehling's solution, which indicated 0.88 per cent.; after boiling the infusion for one hour with hydrochloric acid, 1·42 per cent. of sugar was found.

Commercial Kino.—Chas. H. Breidenbach, Ph. G., examined five samples of Malabar kino and four samples of powdered kino, of which F and G were odorless and had a red-brown color, while H and I had a slight aromatic odor and a very dark-red grayish-brown color, and yielded a gray-brown ash, that of the other samples being white. The results are as follows:

SAMPLES.	PER CENT. OF		PER CENT. SOLUBLE IN			
	Moisture.	Ash.	Ether.	Absol. alcohol.	95 p. ct. alcohol.	Water.
A	11·27	1·37	·81	96·70	93·22	68·20
B	12·50	1·28	·43	97·65	93·50	69·32
C	10·79	1·42	·56	98·00	94·28	67·45
D	13·45	1·32	·67	92·56	90·72	70·90
E	12 92	1·20	·85	94·68	92·16	68·85
F	11·25	1·25	·74	96·24	92·50	68·76
G	12·62	1 34	·63	95·72	91·60	72·17
H	16·78	2·80	·25	99·00	97·42	55·72
I	17·92	2·50	·29	98·80	96·00	58·16

The ether soluble portion dissolved readily in alcohol, and this solution gave, with ferric chloride, a deep-green color. The portions insoluble in absolute alcohol yielded from 65 to 92 per cent. to water, except for H and I, which residues were completely insoluble in water. Of the same two samples the residues left by water treatment yielded to alcohol 98 per cent., while the corresponding residues of the remaining seven samples contained between 77 and 90 per cent. of alcohol soluble matter.

A quantity of gelatinized matter from old tincture of kino was procured and proved to be insoluble in acids, alkalies, alcohol, ether and water; but was not further examined since the kino which had yielded it could not be obtained.

Tincture of kino was made from some of the above samples the menstruum used being 1, the officinal one; 2, alcohol 85, glycerin 15; 3, dilute alcohol; 4, water 75, alcohol 25; 5, absolute alcohol, and 6, 95 per cent. alcohol. The best results were obtained with menstruums 4 and 5, the tinctures with 5 being practically free from precipitates; those with 4 containing a distinct precipitate, and the remainder showing, after a month or two, indications of gelatinizing. Tincture of kino yields with lead acetate a dark bluish precipitate; the same reagent gives with tincture of catechu a light yellow, and with tincture of kino containing 10 per cent. of catechu, a dingy gray green precipitate.

Pills of Thymol are conveniently made by using soap as an excipient, and are prepared by Dr. Frederic-Henry (*Jour. de Méd.*) in the treatment of various intestinal disorders. The thymol is given in doses of 0·12 to 0·15 gm. every six hours.

ON THE SOLUBLE GUM OF TRAGACANTH.

By John M. Maisch.

Read at the Pharmaceutical Meeting, January 15.

From an attentive student at a College of Pharmacy a letter was recently received as follows:

"While comparing your "Manual of Organic Materia Medica" with the United States Pharmacopœia I find a point where your book differs from the latter. You state that the fluid portion of the gelatinous mass, obtained by treating tragacanth with water, is precipitated by alcohol, while the Pharmacopœia says, this is not so. Is this statement of the Pharmacopœia correct?"

My attention having thus again been called to this statement of the Pharmacopœia, it was determined to repeat an experiment frequently made in former years. Some thin flakes of white tragacanth were washed with cold water, and then soaked in sufficient water without applying heat; cold water was then added from time to time with agitation, until the gelatinous mass remained sufficiently thin after standing for some time to permit the fluid portion to be separated by means of a wetted filter. On pouring some alcohol upon the clear filtrate, both layers remained clear also at the point of contact, and on mixing the two liquids, the transparency of the mixture was apparently not disturbed immediately; but on close examination the formation of a transparent jelly could easily be distinguished, and this separated after a while in the form of whitish flocks rising to the surface. The result corroborates that of experiments previously placed on record by others, and proves that a portion of tragacanth is soluble in cold water, and that this solution *is* precipitated by alcohol. In performing this experiment, it is necessary to avoid the use of heat, since tragacanth always contains starch which would be dissolved by hot water.

It seemed of interest to ascertain, if possible, how the error alluded to crept into the United States Pharmacopœia. Very probably it was copied from the British Pharmacopœia of 1867, as will be seen by comparing the texts of the two authorities:

B. P., 1867.	*U. S. P.*, 1880.
. . . . Swelling into a gelatinous mass which is tinged violet by tincture of iodine. After maceration in cold water the fluid portion is not precipitated by the addition of rectified spirit.	. . . Swelling with water to a gelatinous mass, which is tinged blue by test solution of iodine, and the fluid portion of which is not precipitated on the addition of alcohol.

The close similarity in the phraseology of these sentences leaves scarcely any doubt about the origin of the last one. The same error

found also its way into the present British Pharmacopœia, published in 1885, the statement differing from the above quotation mainly in describing the color produced by iodine to be violet or blue.

It was to be expected that the statements of recent English and American writers on Materia Medica and on Chemistry would differ in regard to the question involved, and that some of them would have adopted, without reserve, the characterization of tragacanth as given by the two pharmacopœias, while others would give it as ascertained by experiment or from the writings of others. Such has indeed been found to be the case as will be seen from the following brief summary.

Regarding merely the effect of water upon tracaganth, the latter is described by Bloxam, Edes, Fownes and Wood, as being *not soluble*, but merely swelling in water. The property of swelling with water to a gelatinous mass is, as a matter of course, mentioned by all writers; but in addition to this tragacanth is described to be *sparingly* or *very sparingly soluble* in water by Allen, Brunton, and Milne, (edit. by Craig). These writers do not allude to the effect of alcohol upon the soluble portion.

In several works the correct statement is made that tragacanth is insoluble in alcohol; but this property does not throw any light upon the behavior of the aqueous solution, since some of the vegetable mucilages are insoluble in alcohol when treated directly with this liquid, while their aqueous solutions are not disturbed on the addition of alcohol.

A nearer approach to the behavior of the water-soluble portion of tragacanth is found in Attfield, Biddle, and in Bentley and Trimen's Medicinal Plants, where that portion is said to *resemble* arabin, but the points of resemblance or difference are not given. Potter and Prescott (proximate analysis) state the soluble gum to *be* arabin.

The language of the British Pharmacopœia is quoted in the works on Materia Medica by Bentley, Bruce, Gerrard and Thorowgood, the last two stating that the alcohol test (non-precipitation of the aqueous solution) shows the absence of gum arabic.

The correct behavior towards alcohol is given in Pharmacographia and in the manuals of Muter, Royle (edited by Harley) and Wills.

About half a century ago Pereira, in his Materia Medica, gave the following account, which was reproduced in the later editions:—"The soluble gum of tragacanth is usually regarded as similar to gum arabic, and hence it is called arabin; but is distinguished by silicate of potash and perchloride of iron producing no change in it,

and by a peculiar appearance of the precipitate produced with alcohol (the precipitate is flocculent and collects in a simple opaque and mucous mass). In common with arabin it produces precipitates with diacetate of lead, protochloride of tin and protonitrate of mercury. Oxalate of Ammonia detects in it a calcareous salt."

Gmelin's Chemistry (Cavendish edition, XV., 209) states: "Tragacanth jelly curdles a solution of bichloride of tin; according to Bostock it forms a reddish precipitate with mercurous nitrate; according to Pfaff a white precipitate with both mercurous and mercuric nitrate. It is precipitated by alcohol.

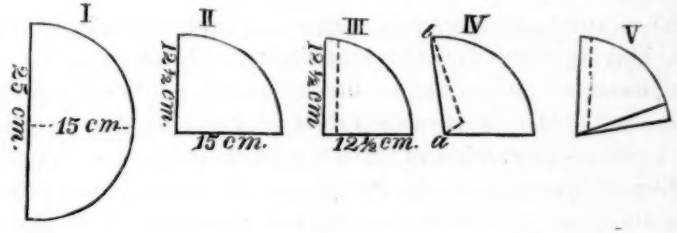
The use of the word *not* in the sentences quoted above from the Pharmacopœias was probably at first an inadvertent error, as suggested by Oldberg and Wahl's "Companion;" but since such errors are likely to be perpetuated in print, it was deemed advisable to again call attention to it at the present time.

ON FILTERS.

By Edo Claassen.

It is well known, that analytical work always requires filtering paper of very good quality; in many cases even the best kind obtainable is necessary. The expenses caused by the high price of such paper are not inconsiderable. On account of this fact and with the purpose, probably, to reduce the cost of filters, Rother recommended the use of pieces of paper, exactly half as large as those usually taken for filters. His filters have a somewhat unsymmetrical shape, unless they are trimmed at last by cutting off the useless and objectionable part. By this operation, however, some paper is wasted, which is entirely prevented, if the filters are made according to the following directions: Patterns (corresponding with the size of the filters wanted, for instance with such, having a radius [semi-diameter] of 12½, 17½, 22½, 27½, 32½, 37½, 42½, 50, 60, 80, and 100 centimeters) are constructed from circular discs of tinned sheet-iron of the same size by cutting off somewhat more than one half the disc (see fig. 1.) through a point distant from the edge 15, or respectively 21, 27, 33, 39, 45, 51, 60, 72, 96 or 120 centimeters. The small section of the disc, if of no use for smaller patterns, may be rejected. Such a pattern is placed on a sheet of paper, a piece of which is then cut off by allowing the scissors to go around on the edge of the tinned iron. This piece is now folded once in such a manner that one part entirely covers the other (fig. 2).

It is then folded so far on the straight open side, that both the straight sides now present are of equal length (fig. 3). The narrow folded part (2½ centimeters wide, if a filter of the smallest size above mentioned is to be made) is folded once more, after which operation the filter is ready for use. If the funnel on hand should happen to have a larger angle (be wider) than 60°, the filter may be easily adjusted by folding the narrow part in the direction from a to b (fig. 4); if, however, the angle of the funnel should be smaller than 60°, the filter may be made



to fit by folding the closed side in an oblique direction as shown (fig. 5). By making filters in this way, two-fifths of the paper necessary for ordinary filters are saved; but three sheets are used instead of five, a matter of importance and therefore to be taken notice of.

It is obvious that this kind of filters will suit also for pharmaceutical work in all cases, which allow or require the use of a plain filter. It, furthermore, may be taken into consideration, that, no doubt, filtration will go on much quicker by means of such a filter than by an ordinary plain filter, it offering a simple layer only of paper to the liquid to be filtered.

MODIFIED FORMULA FOR BROWN MIXTURE.

By J. H. Buckingham, Ph. G.

Read at the Pharmaceutical Meeting, January 15th.

It has always seemed strange that, in this "Age of Elegant Pharmacy," no special attention has been paid to the improvement of such a valuable preparation as the Mistura Glycyrrhizæ Composita. The last Pharmacopœia made a step in that direction, by the substitution of the purified extract of glycyrrhiza, but still the sediment in part remains. After several experiments I beg leave to suggest to the committee on the revision of the Pharmacopœia, the following formula. The finished preparation, a sample of which I send, is elegant in appearance,

palatable in taste, contains no sediment, and is made of the ingredients in the proportion according to the Pharmacopœia.

Purified Extract of Glycyrrhiza	½ oz. avoir.
Sugar (loaf)	½ " "
Gum Arabic in selected pieces	½ " "
Camphorated tincture of Opium	2 fl. oz.
Wine of Antimony	1 " "
Spirit of Nitrous Ether	½ " "
Ammonia water	1 fl. dr.
Water	12 fl. oz.

The mixture of glycyrrhiza, sugar and gum arabic is tied up in a bag. Having mixed the other ingredients, with the exception of the ammonia water, I place them in a wide-mouth bottle and suspend the bag in the liquids. In two days the liquid will dissolve the solids and then I add the ammonia and make the whole measure one pint by the addition of water. All the physicians, to whom I have shown the preparation, are very much pleased; and recommend it, as superior to any "Brown Mixture" they have seen.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Mœrk, Ph. G.

Thiol is a new remedy proposed by Dr. Jacobsen as a substitute for ichthyol; it is made by heating the distillate from peat-tar to 215° with 12 to 15 per cent. sulphur; by treating this product with strong sulphuric acid the sulpho-acid is produced which, after purification, is neutralized with ammonia forming ammonium sulpho-thiolicum, or simply called thiol. It is soluble in water and in a mixture of alcohol and ether, but not so soluble in either solvent singly. The sodium salt is analogous with the above and contains 12·1 per cent. sulphur. They have the same remedial value as ichthyol.—*Apoth. Ztg.*, 1888, 1056.

Ichthyol Pills are recommended by Deni to be coated with balsam of tolu to mask the odor.—(*Pharm. Weekbl.*), *Pharm. Ztg.*, 1889, 7.

Ink and Rust Stains are removed easily by a solution containing ten parts each of tartaric acid, alum and distilled water. The solution has the trade name "encrivoir."—*Pharm. Ztg.*, 1889, 7.

Acetone in Methyl Alcohol.—By addition of an excess of standard iodine solution in presence of potassium hydrate the acetone is con-

verted into iodoform; the excess of iodine is present as iodide and hypoiodite of potassium which react, on acidifying with hydrochloric acid, with each other to liberate iodine which is then titrated with standard sodium hyposulphite. Every 759·6 parts iodine used represent 58 parts acetone.—J. Messinger, *Ber. d. D. Chem. Ges.*, 1888, 3366.

Ash Determinations.—G. Kassner recommends the addition of an equal weight of finely divided metallic silver to such organic substances as are difficultly incinerated. The use is based upon silver absorbing oxygen at higher temperatures which is then readily yielded to the carbonaceous matter. F. Stolba has obtained complete incineration, in ½ to ¾ hours, of substances which, without this addition, required six hours. Ferric oxide can be used in the same way, but the ash is not so easily examined. Platinic chloride and spongy platinum have been used with the same result as with metallic silver.—*Pharm. Ztg.*, 1888, 766, 781.

Manganese oxalate, if added to oils in quantity varying from 2 to 5 per cent., had decided advantages over other manganese or lead compounds in the manufacture of drying oils; the oils become markedly drying, and remain almost white. Manganese oxalate is decomposed by heat into manganous oxide, which remains in the oil, and carbon monoxide and dioxide liberated as gases.—J. Casthelaz (*Bull. Soc. Chem.*), *Chem. Rpt.*, 1888, 346.

Nitrobenzol, if present with oil of bitter almond, can be detected by the following method: Warm with a little sodium hydrate and add ferrous sulphate to destroy odor of hydrocyanic acid; an addition of considerable excess of potassium permanganate will now remove the odor of oil of bitter almond by oxidizing this compound to benzoic acid, while the treatment does not affect the nitrobenzol, which now can be easily detected by its odor.—Dr. K. List, *Chemiker Ztg.*, 1888, 1727.

Antifebrin in Phenacetin, if present to extent of five per cent. or more, can be readily identified by making a saturated aqueous solution, and adding to this half a volume of bromine water. Antifebrin decolorizes the bromine water immediately, and in a few moments a crystalline precipitate appears. Phenacetin neither decolorizes the bromine water nor gives the precipitate, which is supposed to be acet parabromanilide, and is almost insoluble in water.—E. Hirschsohn, *Pharm. Ztschr. f. Russl.*, 1888, 794.

Solubility of corrosive sublimate in solutions of sodium chloride. Dr. Homeyer and E. Ritsert report the following:

Percentage of Na Cl solution.	100 parts Na Cl solution dissolve at 15°	at 65°	at 100°
26 per cent. (saturated).	128 gm. $HgCl_2$	152 gm. $HgCl_2$	208 gm. $HgCl_2$
25 "	120 " "	142 " "	196 " "
10 "	58 " "	68 " "	110 " "
5 "	30 " "	36 " "	64 " "
1 "	14 " "	18 " "	48 " "
0.5 "	10 " "	13 " "	44 " "

For hospital use, instead of a concentrated alcoholic solution, they recommend: Corrosive sublimate 50; sodium chloride 5; distilled water 45.—*Pharm. Ztg.*, 1888, 739.

Sodium hydrate containing nitrate is a common article of commerce, the origin of the nitrate being the demand for a pure white sodium hydrate, to obtain which from 2% to 3% nitrate are added by the manufacturer. This impurity is especially objectionable in nitrogen determinations using Kjeldahl's method by making the results too high.—Dr. Schweissinger, *Pharm. Centralhalle*, 1888, 587.

Syrupus Ferri Iodidi has been studied by Zelinka relative to its decomposition; the conclusions arrived at are that if a pure distilled water, free from chlorine, ammonia, carbon dioxide and other volatile impurities, obtained by rejecting the distillate until this gives no reaction with silver nitrate, be used in the preparation of the syrup a product will result that can be kept in larger quantites for a long time.—*Pharm. Post*, 1888, 794.

Volumetric estimation of glucose.—In the usual method by precipitation with Fehling's solution, the cuprous oxide renders the end reaction indistinct to prevent which H. Causse recommends the addition of ferro-cyanide of potassium to the reagent which will dissolve the precipitated cuprous oxide and which itself exerts no reducing action on Fehling's solution. To carry out the operation 10 cc. Fehling's solution are mixed with 4 cc. solution of ferrocyanide of potassium (1:2), heated to the boiling point and the sugar solution added, drop by drop, until the solution becomes colorless.—(*Bull. Soc. Chim.*) *Chem. Rpt.*, 1888, 338.

Volatile Alkaloid in Ipecacuanha.—E. M. Arndt in distilling a mixture of powdered ipecac, potassium carbonate, ferric chloride and water, noticed in the condenser white crystals while the distillate had an alkaline reaction and was fluorescent; the alkaloid was obtained

in colorless cross-like crystals fluorescent at the edges and deliquescent. The hydrochlorate crystallizes best in octahedral form, and can be obtained in quantity from 0·3 to 0·5 per cent. The nitrate does not crystallize even when attempted over H_2SO_4, resembling nitrate of emetine. $PtCl_4HgI_2 2KI$, Nessler's reagent, and iodine solution yield precipitates; Na OH on boiling, evolves the odor of trimethylamine. The yield of emetine by the ferric chloride and potassium carbonate method of estimation is greater than by other methods, hence this precludes the decomposition of emetine.—*Apoth Ztg.*, 1888, 1036.

Oxygen can be prepared handily by the action of hydrogen dioxide upon potassium permanganate; 100 cc. of the commercial hydrogen dioxide, 3 per cent. will yield about one liter oxygen. A generating flask is half filled with the H_2O_2, made alkaline by a few drops of NH_4OH, and $K_2Mn_2O_8$, is slowly added through the funnel-tube (5cc. of a 0.3 per cent. solution), when the reaction ceases more of the $K_2Mn_2O_8$ is added. All of the available oxygen has been obtained if the liquid in the flask retains a red color on acidifying with sulphuric acid.—*C. F. Göhring, Chem. Ztg.*, 1888.

W. Lindner recommends the use of an acid solution of H_2O_2.—*Chem. Ztg.*, 1888, 1696.

ABSTRACTS FROM THE FRENCH JOURNALS.

Translated for the AMERICAN JOURNAL OF PHARMACY.

INALTERABLE IODIDE OF POTASSIUM OINTMENT.—A writer in the *Gior. Farm. Trent.* gives the following: Iodide of potassium, white Venice soap, distilled water, of each, 100; glycerin, 600; fresh, or benzoinated lard, 300. Dissolve the iodine in the water (using a water-bath), and then the soap; add the glycerin, and afterward the lard. As soon as the lard has melted stir rapidly and continually, and stand the dish in cold water.—*Repert. de Phar.*, Nov. 1888.

INCOMPATIBILITY OF CHLORATE OF POTASSIUM AND IODIDE OF IRON.—Sesquioxide of iron is formed, and the iodine set free: $2\,Fe\,I^2 + KClO^3 = Fe^2\,O^3 + KCl + 4\,I$. The administration of this mixture caused death.—*Boll. Farm.; L'Union Phar.*, Dec. 1888.

GLYCERIN SUPPOSITORIES.—The following formulæ, presented by *Nouv. Rem.*, Dec. 24, are brought together from German sources; 1.

Cacao butter, 2·50 gm. to 5 gm.; glycerin, 1 gm. to 2 gm.; gum tragacanth, 2 cgm. to 4 cgm. 2. Glycerin, 90 parts; medicinal soap and mutton suet, of each 5 parts. Dissolve the soap in the glycerin and add the suet; melt and stir; pour into molds and let stand in a cold place for 24 hours. See also AM. JOUR. PHAR., 1888, p. 560.

LANOLIN IN SUPPOSITORIES.—According to M. L. Broutin, *Bull. Com.*, Nov., 1888, lanolin greatly facilitates the introduction into suppositories, of extracts or other substances soluble in water. He thinks that when the choice of an excipient is left to the pharmacist, he may properly replace a small quantity of the cacao butter with lanolin. The following formula is cited as having given excellent results: Dry extract of hamamelis, 1·75 gm.; lanolin, 9 gm.; cacao butter, 90 gm.; for 25 suppositories. The extract is heated with a sufficient quantity of water, to which the melted butter is added by degrees. The mass should be run off as soon as it commences to thicken. The suppositories are entirely homogenous.

INJECTION BROU.—The *Jour. de Phar. et de Chim.*, Jan. 1, gives the formula as follows: Make an infusion with: Crude opium, 50 cgm.; catechu, 50 cgm.; saffron, 1 gm.; boiling water, 200 gm. Filter, and add: Acetate of lead, 1·50 gm.; sulphate of zinc, 3 gm.

RATAFIA OF CACAO.—Dr. L. Jeannel having made this preparation in accordance with Guibourt's formula, as given in l'Officine, obtained unsatisfactory results. After trying several combinations he has arrived at the following, which he recommends: Cacao (bruised and torrefied), 750 gm.; sliced vanilla 2 gm.; alcohol of 56 per cent. 4000. Macerate for 15 days; strain; add to the residuum, boiling distilled water, 1,100. Leave to cool; add to the infusion, crushed sugar, 1300. Dissolve, mix with the alcoholic liquor, and filter.—*Bull. Com.*, Dec. 1888.

ARRACK OR YARAQUE.—In a communication to the *Académie des Sciences*, M. V. Marcano states that the natives of upper Orinoco make arrack from the root of Manihot utilissima or cassava. It is dampened, covered with banana leaves and allowed to stand for several days. The substance is then bruised and placed in a cylinder woven with banana leaves and having an opening at the bottom. From this aperture a thick, syrupy liquid runs slowly and is collected. The day before arrack is wanted, a bitter aromatic infusion is introduced at the top of the cylinder. The resultant liquor ferments very energetically and gives an intoxicating drink. Among

some of the tribes the mass contained in the cylinder is simply thrown into water, where fermentation proceeds and gives a cloudy alcoholic liquor.—*J. de Phar. et de Chim.*, Jan. 1, 1889.

THE NATURE OF MILK.—The results of a study of this subject were lately submitted by M. A. Béchamp to the Paris Society of Pharmacy. The author's conclusions are: Milk is not an emulsion. The milky globules are not simple fat globules, but true adipose vesicles in a freed condition. Cow's milk contains, beside casein, albuminoid substances which are not free, being dissolved in combination with alkalis. Human milk is not, properly speaking, a casein milk; it contains a ferment which is peculiar to it. (See *Comptes rendus*, XCVI, p. 1508). Milk coagulates spontaneously, *i. e.*, without the aid of vibriones.—*L' Union Phar.*, Dec. 1888.

CORONILLA SCORPIOIDES.—Schlagdenhauffen and Reeb have separated from the leaves the bitter principle, *coronillin*, to which they assign the formula $C^{11}H^{12}O^5$. It is a yellowish powder, soluble in water, acetone and amylic alcohol; slightly soluble in chloroform and ether. Heated with diluted hydrochloric acid an amorphous resin is separated, to which the authors give the name of coronillein. This also occurs as a yellow powder but is not bitter to the taste. It is insoluble in water, but dissolves in alcohol, acetone and chloroform. Coronillin, say the authors, is a heart poison; coronillein has no perceptible physiological action.—*Nouv. Rem.*, Dec. 24, 1888.

TOXIC EFFECTS OF COCAINE.—Dr. Moizard reports that a child *aet.* four years took by accident 25 cgm. of cocaine. There was no immediate effect; the child went quietly to sleep. One hour afterward he awoke in frightful agony. The face was pale, respiration difficult, nausea, pains in the upper portion of the chest, formications, cramps of the limbs, and great muscular agitation. The child could get no rest, and was a prey to terrifying hallucinations. An enema with 50 cgm. of chloral, followed two hours later by one of 30 cgm., was given. The child began to get quiet. During the night it slept, but was frequently awakened by convulsive movements. On the following day it was perfectly well.—*Jour. de Méd.*, Dec., 1888.

ACTION OF HYOSCINE.—According to Gley and Rondeau (*Gaz. Méd. de Paris*, 1888, 10), hyoscine causes dilatation of the pupil, nerve paralysis, arrestation of the heart, suppression of the salivary secretion, paralysis of the cord of the tympanum and of the excito-secretory nerve. Sleep caused by hyoscine is accompanied with great

muscular agitation. The experiments were made on dogs and rabbits.—*L' Union Méd.*, Oct. 4, 1888.

A CHARACTERISTIC REACTION OF BISMUTH.—A solution of iodide of bismuth in iodide of potassium is sometimes used, under the name of iodobismuthate of potash, for the research of the alkaloids. It gives insoluble, orange-yellow compounds with many natural inorganic bases, but gives no indication of the nature of the alkaloid found. I have thought, writes M. E. Léger, that this would be otherwise should we use such a reagent in finding bismuth. I used a reagent composed of cinchonine, 1 gm.; iodide of potassium, 2 gm.; distilled water, 100 gm. The cinchonine is dissolved in water with the aid of a few drops ot nitric acid; the liquid is heated and the iodide added. This solution, added to one of nitrate of bismuth gives an orange yellow precipitate. It should be used in excess, avoiding solutions containing hydrochloric or sulphuric acid; it must not contain too much nitric acid. This reagent may be used for metals precipitable by H_2S, whose sulphides are insoluble in sulphhydrate of ammonium. It gives, with minimum solutions of mercury greenish-yellow precipitate, turning black with excess; maximum solutions give yellowish-white; cadmium, white or yellowish; silver, the iodide if the argentic salt is in excess, yellow if the reagent is in excess; copper (minimum) precipitate of cupric iodide; maximum, brown maroon, containing iodine, copper and cinchonine; lead, sulphur-yellow precipitate, soluble in an excess of nitrate of lead, and containing iodine, lead and cinchonine.—*J. de Phar. et de Chim.*, Dec. 15, 1888.

THE ANATOMICAL STRUCTURE OF GRINDELIA ROBUSTA.[1]

BY JOSEPH BEAUVAIS, MOSCOW.

Grindelia robusta belongs to the order of Compositæ, suborder Tubulifloræ, and is an herb with oblong, thickish, light green and toothed leaves. Both sides of the leaves have the epidermis covered with a thick cuticular layer and contain glands and stomata. The glands consist of a one-celled base bearing the gland-cell which is filled with resin. Beneath the epidermis of both the upper and lower surface is

[1] Translated from *Berichte der Deutschen Botanischen Gesellschaft*, 1888, p. 403. —J. M. M.

found a layer of parallel palisade cells containing chlorophyll; the central part of the mesophyll consists of spongy parenchyma, in which the vascular bundles are imbedded. These bundles are closed, collateral, and are surrounded by a sheath of thick-walled collenchyma, gradually passing into the hypoderma of the upper and lower surface of the leaf. Rather large resin ducts are put within this collenchyma layer.

Ths involucre of the flower head consists of spirally arranged scales. A transverse section through the top portion of these scales is nearly circular, and is covered with an epidermis, bearing glands and stomata upon the outer surface, and covering several tiers of palisade cells, both on the outer and inner surface. A vascular bundle in the centre of the scale is surrounded by a layer of collenchyma containing resin ducts.

The transverse section through the middle of the involucral scale is elongated in shape and is divided into an upper and a lower part by a rather broad zone of sclerenchyma. In the upper part beneath the epidermis is a palisade layer extending to the edges; but the lower part has no palisade cells, but contains elongated, thick-walled cells, forming large intercellular spaces. Near the base of the involucral scale the edges are free from palisade cells, but contain collenchyma.

The florets are small, and collected into many-flowered heads; those of the outer row are unisexual and ligulate, while the disc florets are tubular. The latter are on both sides covered with a cuticized epidermis, and contain a slightly developed mesophyll with compressed cells, which, however, are wanting in some parts of the corolla. The ligulate florets have a well-developed mesophyll consisting of thin-walled cells, and containing yellow oil in the intercellular spaces. Papillæ are formed on both sides of the epidermis.

Anthers, gynæcium and the seed show no striking characteristics. The receptacle has rather long appendages (Zotten) which differ from those of most compositæ in not containing vascular bundles.

Acetic Acid as an Antiseptic.—In $\frac{3}{5}$ per cent. solutions, acetic acid has given favorable results as an antiseptic in gynecological practice. It has several advantages, in that it is not poisonous, like carbolic acid; it is hæmostatic, and becomes absorbed readily. It does not injure instruments like bichloride of mercury (*Jour. de Méd de Paris*).—*Med. News*, Nov. 24, 1888.

ARROW-POISON OF THE SOMALIS.[1]

By ARNAUD.

The Somalis on the east coast of Africa prepare an arrow-poison from the aqueous extract of the wood, and especially of the root of Ouabaio, a tree which is closely related to although not identical with *Carissa Schimperi*, a native of Abyssinia.

A concentrated extract of the wood in warm water was prepared and precipitated with lead acetate, the filtrate treated with hydrogen sulphide, and the second filtrate boiled and afterwards concentrated in a vacuum. The concentrated solution was mixed with six times its volume of alcohol of 85°, boiled, allowed to cool in shallow vessels, and the crystals thus obtained purified by recrystallization first from alcohol of 85° and afterwards from water.

The *ouabaïn* thus obtained contains no nitrogen and has the composition $C_{30}H_{46}O_{12}$. It forms thin, white, nacreous lamellæ with no taste, no smell, and a neutral reaction. It is almost insoluble in cold water, but is readily soluble in boiling water, with a great tendency to form supersaturated solutions, and also dissolves readily in moderately concentrated alcohol, but is almost insoluble in absolute alcohol and insoluble in ether or chloroform. At 180°, it becomes pasty with slight decomposition, and at 200° it is completely melted. A warm aqueous solution has a rotatory power $[a]_D = -34°$. A concentrated aqueous solution gives a precipitate with tannin. When boiled with dilute acids, it yields a reducing sugar, and hence it would seem that ouabaïn is a glucoside.

When ouabaïn crystallizes from an aqueous solution, it contains 7 mols. H_2O which is not completely expelled below 130°.

When boiled with barium hydroxide, ouabaïn yields a barium-derivative which when dried at 100° has the composition $Ba(C_{30}H_{47}O_{13})_2$.

Ouabain has no toxic effect when introduced into the stomach, but when introduced by subcutaneous or intravenous injection, it acts on the heart and produces death. 2 milligrams will kill a dog of 12 kilos. in a few minutes.

Magnesium silicate is recommended by Dr. Debove in chronic diarrhœa. Dose 1·5 to 4·0 gm. To phthisical patients it is given with milk for a prolonged period.—*D. Med. Woch.*

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[1] *Compt. rend.*, cvi., 1011–1014, reprinted from *Jour. Chem. Soc.*, 1888, p. 848.

STROPHANTIN.[1]

By Arnaud.

The crushed seeds of *Strophantus Kombé* are treated with boiling alcohol of 70° for several hours, and the solution distilled to a small bulk on a water-bath; the distillation is finished in a vacuum, care being taken that the extract remains liquid. The residue is cooled, the supernatant oil and resin separated, the liquid filtered, and heated with a small quantity of basic lead acetate and some finely powdered litharge. The liquid is again filtered, the lead removed by means of hydrogen sulphide, and the filtrate concentrated at 50° to a thick syrup, from which the strophantin slowly crystallizes. The crystals may be purified by recrystallization from boiling water; the yield is 4·5 grams per kilo.

Strophantin is a white bitter substance, which crystallizes in micaceous plates, grouped round a nucleus. It readily retains water mechanically, and also forms a hydrate, which loses its water in a vacuum or in dry air. The hydrate melts below 100°, and the residual strophantin is uncrystallizable. If, however, strophantin is carefully dried in a vacuum, it may be heated at 110° without alteration. Anhydrous strophantin becomes pasty at 165°, and partially decomposes. It acts on polarized light: the rotatory power of a 2·3 per cent. aqueous solution $[\alpha]_D = +30°$. It is only slightly soluble in water, and somewhat soluble in alcohol, but is insoluble in ether, carbon bisulphide, and benzene. It is precipitated from its aqueous solutions by tannin.

Strophantin contains no nitrogen, and has a composition corresponding with the formula $C_{31}H_{48}O_{12}$. It seems to be the immediate higher homologue of ouabaïn which it closely resembles in properties. Perhaps these and all other cardiac poisons have a common nucleus.

The removal of Warts by Carbolic Acid.—Professor B. Frankel, in the *Wiener medizinische Presse*, Oct. 1888, recommends the following method for the removal of warts: The skin surrounding the wart should be covered with cotton, and thus protected. Then, by means of a glass rod, apply the liquid carbolic acid to the wart and allow it to dry. No pain is perceptible. In the course of two or three days a part of the wart will fall off. Renew the application until all has been removed.—*Med. News*, Dec. 1.

[1] *Compt. rend.*, cvii., 179–182; reprinted from *Jour. Chem. Soc.*, 1888, p. 1310.

DIOSMIN.[1]

By P. Spica.

In the author's former examination of the leaves of *Barosma crenata* and *B. betulina*,[2] it was found that after the essential oil had been removed, alcohol extracted from the leaves a crystalline substance, which he called *diosmin*. The amount present in the leaves varies very much, not only with the season when they are gathered, but also with the age of the plant; at no time, however, is it large. The best way of extracting it is first to treat the leaves with light petroleum to remove the essential oil and waxy and resinous matters, then with cold alcohol of 85 per cent., which removes the chlorophyll and acid extractive substances, and finally to treat it with boiling alcohol of 80 to 85 per cent., which is the best solvent for the diosmin. It is very troublesome to purify, but this may be effected by treating the residue left on evaporation of the alcoholic solution successively with a solution of ammonium carbonate, cold alcohol, and ether, and then recrystallizing repeatedly from alcohol of 80—85 per cent.

When pure, diosmin is a white, crystalline powder, consisting of very slender microscopic needles, odorless, tasteless, and insoluble in most solvents. Its best solvent is boiling alcohol of 80—85 per cent. It melts at 243—244°, with decomposition and evolution of gas. If cautiously melted on platinum foil, it emits a pleasant odor resembling that of orange peel when it begins to burn; subsequently the odor is like that of caramel. Diosmin does not reduce Fehling's solution. It dissolves in concentrated sulphuric acid, and in solutions of the alkalis with yellow coloration, but at the same time undergoes alteration.

When diosmin is boiled for some time in a reflux apparatus with dilute hydrochloric acid, or with sulphuric acid of 3—4 per cent., it is resolved into a crystalline compound, sparingly soluble in water, and a substance easily soluble in water; the latter has a feeble dextrorotatory power, and is capable of reducing Fehling's solution. The crystalline substance is moderately soluble in alcohol, and still better in a mixture of alcohol and benzene. It forms minute, orange-yellow needles, for which no definite melting point could be obtained, but it appears to be somewhere about 145°.

The results obtained by the analyses of diosmin dried in a vacuum

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[1] *Gazetta*, xviii., 1–9; reprinted from *Jour. Chem. Soc.*, 1888, p. 1310.

[2] Am. Jour. Phar., 1886, p. 478.

over sulphuric acid are, C = 53·43, H = 6·17 (mean of three analyses), which closely agree with the numbers obtained by Paternò and Briosi for hesperidin, namely, 53·44 and 5·92; but E. Hoffman, taking the formula as $C_{22}H_{26}O_{16}$ (C = 54·77 and H = 5·39), considers that the sample analyzed by Paternò and Briosi was incompletely dried, and that a temperature of 150° is necessary to remove all the water.

On heating diosmin in a current of air at 150—160°, it lost 4·2 per cent. of water, and on analysis then gave numbers corresponding with C = 57·77 and H = 6·00. The author is making a careful comparison of diosmin with hesperidin, in order to ascertain whether they are identical or not.

LAUREL-NUT OIL.

By David Hooper.

The Alexandrian laurel (*Calophyllum Inophyllum*, L.) is distributed throughout India and Malaya, and is especially abundant on the western coast and in the native state of Travancore. The Hindustani name of the tree is Sultan Champa, the Tamil and Malayalam name is Punnai. Its thick green and glossy leaves resemble those of a laurel, but the tree is far removed from this family of plants, as it is really a Guttifer, belonging to the natural order Clusiaceæ. The fruit is about the size of a bantam's egg when ripe, and of a greenish yellow color; when dry it is brown or black and has a hard wrinkled surface. The seed, consisting of two white closely united hemispherical cotyledons, loses in drying 30 per cent. of water, and the dried seed yields 68 per cent. of fixed oils. This oil is largely used for burning, and is occasionally used for making varnishes and soap. In medicine the oil is employed either alone or mixed with more powerful remedies as a liniment for rheumatism, and is applied to ringworm and various skin eruptions. The tariff valuation of laurel-nuts in Travancore is Rs. 7 per cwt. and the oil Rs. 8 as against cocoa-nut oil Rs. 14 per cwt. The value of the exports of laurel-nut oil from Travancore during the past five years has been as follows:—1882–83, Rs. 74,314; 1883–84, Rs. 68,767; 1884–85, Rs. 48,997; 1885–86, Rs. 78,845; 1886–87, Rs. 57,148. In 1886–87 63 cwt. was exported from Alleppey. Dr. Watt says that although this oil cannot compete with castor oil for industrial purposes in the Calcutta market, it fetches

about four times the Calcutta price of castor oil in Burma.[1] In the Colonial and Indian Exhibition[2] held in London in 1886, this oil was shown from India, Ceylon, Straits Settlements, Queensland and Fiji. It is known out of India as domba, dilo or ndilo oil.

Laurel-nut oil is greenish-yellow, bitter and aromatic, but it has not been investigated chemically. Lépine found a sample to have the sp. gr. 0·942, and to solidify at +5°. During a recent visit to Travancore, I found a large trade being done in the nuts and oil of *Calophyllum Inophyllum* in the village of Neyoor, about sixteen miles from Cape Comorin, and here I purchased a sample of oil for examination. The oil was similar in appearance to some I expressed myself from some freshly dried almonds obtained from Neyoor. The following notes give the results of a chemical examination of the oil made with the assistance of Allen's "Commercial Organic Analysis."

The oil had a greenish-yellow color, thick consistence, fragant odor and bitter taste. It commenced to congeal at the temperature of 19° C., and became quite solid at 16°, when it had a specific gravity of 0·9315.

The free acidity of the oil was found by shaking a weighed portion with alcohol and titrating the solution with normal alkali, using phenolphthalein as an indicator. One hundred grams of the oil required 1·89 grams of caustic potash to neutralize the free acids.

The oil was saponified by boiling a weighed quantity for one hour with alcoholic potash, and the excess of alkali was determined by titration with normal hydrochloric acid. It was found that 100 grams required 19·6 grams of KHO to convert it into a soap; the saponification equivalent was therefore 2 5·6. The soap solution in alcohol, allowed to stand for a few hours partially crystallized into lustrous white scales.

The volatile fatty acids obtained by Reichert's distillation process were very small in quantity, 2·412 grams of oil required the equivalent of 0·1 cc. of normal alkali for saturating the volatile acids, which is equal to 0·23 per cent. of KHO.

Two drops of sulphuric acid added to 20 drops of the oil gave a red coloration with orange streaks; after stirring the whole became an orange-brown mixture. The oil shaken up with an equal volume of nitric acid, sp. gr. 1·4, formed a light reddish-brown emulsion; after

[1] "Guide to the Economic and Commercial Court," Calcutta, 1886.

[2] *Pharm. Journal*, [3], xvii., pp. 6, 142, 226.

standing for an hour the oil separated with a rich mahogany brown color, and the lower acid liquor was red. Treating the oil according to Poutet's elaïdin reaction, and working at a temperature of 20°, the mixture of oil and nitric oxide solution congealed in two and a half hours; after twenty four hours it remained as a firm butter-like solid of a dull lemon color, and yielding to the pressure of the finger.

5·045 grams of the oil were on November 7th exposed to the air in a watch-glass under a bell-jar, and weighed daily for one month. The increase in weight was just appreciable after the exposure; the weight on December the 7th was 5·047. This quantity of oil heated in a water-oven at 93° for eight hours gained 0·006 gram only.

The insoluble fatty acids amounted to 90·85 per cent. They crystallized into radiating tufts of acicular crystals having a melting point of 37·6°, and a specific gravity of 0·9237 (solid) at 16°, and of 0·8688 at 90°. Their mean combining weight, obtained by titrating the washed and dried acids with normal alkali and using phenol-phthalein as an indicator, was found to be 283·1. A lead soap of the fatty acids was made by decomposing the potash soap with a hot solution of plumbic acetate. After washing and drying, 1 gram was weighed out and shaken up with ether; the oleate of lead, or soluble lead soap, weighed ·44 gram after the ether had been rapidly driven off. The lead soap insoluble in ether was decomposed, and the purified fatty acids had a melting point of 58°.

The oil agitated with 85 per cent. alcohol removed the green coloring matter and a sticky extract possessing the peculiar melilot-like odor and the bitter taste. This extract amounted to about 7 per cent.; it was almost entirely soluble in dilute alkalies with an orange color, precipitated unaltered on the addition of acid, and was perfectly soluble in ether and chloroform. The green mass was boiled with water and the filtered liquor evaporated, had the odor of coumarin, but no rhombic crystals of coumarin could be observed in the slight residue when examined under a microscope. The alcoholic residue was crystalline, and contained some free fatty acids of the oil.

The conclusion arrived at from the examination of the laurel-nut oil is that it cannot be regarded as a drying oil, nor altogether as non-drying, but must take up an intermediate position between the two. In endeavouring to classify this oil with those that have already been investigated, the task is not difficult. Most of the experiments exhibit in a very striking manner a strong relationship to those of the cotton-

seed oil group. The saponification equivalent, the high melting point of the fatty acids and the free acids are very remarkable, and the sulphuric and nitric acid tests are particularly allied to those performed upon cotton-seed oil.—*Phar. Jour. and Trans.*, January 5th, p. 525.

PHENOL AND SOME ALLIED SUBSTANCES AS TESTS WITH CONCENTRATED SULPHURIC ACID FOR NITRITES, NITRATES, AND CHLORATES IN AQUEOUS SOLUTION.[1]

By D. Lindo.

The author employed the following solutions in his numerous experiments. Phenol:—10 cc. of Calvert's No. 1 fused, dissolved in some water mixed with 25 cc. of 97 per cent. alcohol, and made up to 100 cc. with water. Orcinol:—5 grams dissolved in water, and made up to 100 cc. Sulphuric acid, pure commercial, sp. gr. 1·837 at 26°. Nitric solution:—1·8723 grams of potassium nitrate made up to 100 cc. = solution 100 N_2O_5. Nitrous solution:—0·4053 gram of silver nitrite dissolved in 100 cc. of boiling water, mixed with 0·160 gram of sodium chloride in solution, allowed to cool, made up to 200 cc., agitated, and when settled and filtered = solution 2000 N_2O_3. Chloric solution:—1·624 grams of potassium chlorate dissolved and made up to 100 cc. = solution 100 Cl_2O_5. The solutions of hydrochloric acid used were *a*, containing 26·16 per cent., *b* 13·08 per cent., and *c*, 4·88 per cent. The sulphurous acid solution contained about 4 per cent. of the gas. The ferric chloride about 36·5 per cent. of the salt, the ferrous sulphate 10 per cent., and the copper sulphate 0·5 per cent. of the metal. In all experiments, 0·5 cc. of the solution to be tested was mixed with one drop of phenol or two drops of orcinol solution, except with chlorates, when 1 drop of orcinol was employed; 2 cc. of sulphuric acid is then run down the side of the tube so as to obtain bands of color at the contact of the liquids. When sulphurous acid is used it is always added first, the phenol or orcinol being always the last added before the sulphuric acid. The following are some of the results obtained.

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[1] *Chem. News*, lviii., 1–3, 15–17, 28–29, 40; reprinted from *Jour. Chem. Soc.*, 1888, p. 1337.

Phenol and nitrites:—A 200,000 N_2O_3 solution yields a faint pink band at first, faint green below; pink band very distinct in half an hour, but after five hours the color has faded away. 50,000 N_2O_3 solution gives good red and green bands at once, fading after five hours. 2000 N_2O_3 solution very intense red and green bands in 24 hours, the latter changes to blue and the red to dingy purple. Solutions of intermediate strengths give intermediate reactions, and even 400,000 N_2O_3 gives a very faint band. Hydrochloric acid impedes or retards the reaction, so that 1 drop of solution *a* renders the color with 200,000 N_2O_3 indistinct, and 2 drops upset the reaction with 50,000 N_2O_3 solution, and make the 10,000 give a light red band with yellowish-green below. Two drops of sulphurous acid, on the other hand, prevent the color forming even with the 2000 N_2O_3 solution; but with the addition of copper sulphate (see below) a slight pink band is obtained after two or three hours, presumably due to a trace of N_2O_5.

Orcinol and nitrites:—One of nitrite in 1,000,000 of water gives a faint but uncertain indication after some time; 500,000 N_2O_3 gives a very faint pink after four hours, becoming more distinct in nine hours; 10,000 N_2O_3 solution gives a strong orange band at once, becoming almost opaque after some time. The color is permanent. Hydrochloric and sulphurous acids both interfere with the reaction, but copper sulphate with hydrochloric acid increases the delicacy; 1,000,000 N_2O_3 + 1 drop of copper sulphate + 2 drops of orcinol + hydrochloric acid, sharp orange-pink band in 10 minutes.

Phenol and nitrates:—No reaction with 1 N_2O_5 in 20,000 of water, 10,000 N_2O_5 faint, pink band becoming broader and less definite, ultimately fading. 1000 N_2O_5, intense red band, pale green below becoming very dense. Intermediate and stronger reactions are given in the original. Phenol alone appears to be but a poor test for nitrates, but in the presence of hydrochloric acid it becomes very delicate; by adding one drop of solution *c* 100,000 N_2O_5 gives a faint pink at once, which becomes distinct in 20 minutes, spreads and ultimately fades; 10,000 N_2O_5, a sharp, crimson band at once, spreading without losing intensity for some hours, and faint green below, soon fading. 1000 N_2O_5, very dense red, green below. Sulphurous acid does not interfere with this test, or with the corresponding one with orcinol. Neither ferric chloride nor copper sulphate disturbs this reaction, in fact, the latter rather improves it with highly dilute N_2O_5 solutions;

but ferrous sulphate is fatal, so that with 1 drop of the solution, and hydrochloric acid 10,000 N_2O_5 gives no reaction, and 5000 is very indistinct.

Orcinol and nitrates:—The remarks which apply to phenol are mostly true of orcinol, but with the addition of hydrochloric acid the latter is more sensitive, indicating by a faint pink color 1 N_2O_5 in 200,000 in three hours, and with extreme faintness 1 in 500,000. The color is permanent, and orcinol may be regarded as very superior to phenol for detecting traces of nitrate in the presence of large quantities of hydrochloric acid or chlorides. Ferric chloride is objectionable, but neither sulphurous acid nor ferrous sulphate interferes with the reaction, whilst copper sulphate makes it more delicate; 500,000 N_2O_5 with hydrochloric acid, 1 drop of copper solution and 2 drops of orcinol gives sharp bands in five minutes.

With chlorates, phenol gives a pale yellow band with blue below, the latter soon fading with 10,000 Cl_2O_5; with 4000, the blue soon changes to dingy green, with 2000 the blue is dingy and becomes dingy green; with 1000 and upwards no blue is developed. Orcinol is somewhat more delicate, 100,000 Cl_2O_5 giving a faint transient blue band, which becomes more distinct as the strength of the solution increases, so that with 10,000 Cl_2O_5 a beautiful blue band is produced, soon acquiring the colors of the rainbow, 4000 gives a similar effect, but not so good, owing to interference of a deep green coloration: 1000 gives an intense green, soon turning brown, and 100 only a pale yellow. These changes are not observed with other oxidizing agents, and therefore this may possibly become a characteristic test for chloric acid. Hydrochloric and sulphurous acids interfere slightly with this reaction.

These reactions have been applied to the detection of nitrites, nitrates, and chlorates in the presence of each other, and the author has tested this point by various mixtures made from his solutions. With nitrites and nitrates in various proportions there seems to be no difficulty in detecting them both; the nitrite is first identified, the mixture is then treated with a drop or two of sulphurous acid to destroy the nitrite; to ensure the complete destruction of the nitrite the solution of the mixture should be acid; it is then tested again with hydrochloric acid and orcinol, or if great delicacy is desired, with the addition of copper sulphate, when mere traces of nitrate give a coloration. With nitrites and chlorates, the red coloration with phenol and

sulphuric acid due to nitrites is first obtained; and then, after treatment with sulphurous acid, the chlorate may be detected by the blue color with orcinol and sulphuric acid. The results show that chlorate can be detected when mixed with a considerable excess of nitrite after the latter has been destroyed with sulphurous acid, but nitrites cannot be detected by this method if the chlorate is greatly in excess. With mixtures of chlorates and nitrates, the former cannot be detected if the latter are in considerable excess; but, on the other hand, a small quantity of nitrate can be detected in the presence of a large quantity of chlorate, since by allowing the sulphurous acid to act for about 15 minutes the chlorate is completely destroyed, whilst the nitrate remains and gives its color reaction in the usual manner; when, however, the chlorate is not in great excess the nitrate may even be detected with hydrochloric acid, phenol, and sulphuric acid, without previously destroying the chlorate. When all three are present in the same solution, they can be tested by these reactions only when the proportions indicated above are not exceeded; for instance, a mixture of equal volumes of 10,000 N_2O_3, 10,000 N_2O_5, and 10,000 Cl_2O_5 would give the red band with phenol and sulphuric acid for nitrites; a blue band with 1 drop of sulphurous acid and 1 drop of orcinol for chlorates; and by treatment with 2 drops of sulphurous acid and 1 drop of hydrochloric acid, allowing to remain 15 minutes, copper sulphate and orcinol would give the orange bands due to nitrate.

The presence of iodides, bromides, and even chlorides in large quantities would prevent the detection of nitrites, nitrates, or chlorates by this method, if these are present, therefore, the solution must be precipitated with silver sulphate. Thymol and *a*-naphthol do not give distinct and characteristic reactions for these salts under the conditions given in the paper; but the following test is recommended by the author for nitrite in very dilute solutions: two or three drops of the alcoholic *a*-naphthol and one or two drops of 1 : 1 sulphuric acid added to 10 cc. of 1 in 1,000,000 nitrite solution, gives in a few minutes a pale, greenish-yellow color; with much stronger solutions, a precipitate separates, and the color of the liquid approaches orange.

For the sake of comparison, the following substances were tested with sulphuric acid and 1 drop of phenol or 1 drop of orcinol to 0·5 cc. of the solution :—Potassium ferricyanide in strong solution gave a brown band with sulphuric acid alone, in weak solutions it gave a brown band

with phenol, and yellow turning brown with orcinol. $\frac{N}{50}$ Potassium permanganate gave with *phenol* a broad, turbid, light reddish-brown band; and with *hydrochloric acid*, in addition, a broad, pale yellow upper band with a narrow, ruddy lower band, changing to bright vermilion; with *orcinol*, it gave reddish upper and dull green lower band, and with *hydrochloric acid* in addition a dull orange upper and emerald-green lower band; in presence of two drops of sulphurous acid, no reaction. Potassium dichromate, 0·5 gram per litre of water, with or without hydrochloric acid, gave with *phenol* a brown band soon becoming lighter, with *orcinol*, a dull, prismatic band; in presence of sulphurous acid no reaction; distinction from chlorates. Hydrogen peroxide, 3 vols. strength diluted with 20 vols. of water, gave with *phenol* a reddish upper, and dull green lower band, and with *hydrochloric acid* a very faint, purple band, changing to pink; with *orcinol*, a sharp reddish band, changing to dull orange above, olive-green below, and with *hydrochloric acid* a purple upper, weak olive-green lower band; no reaction in presence of sulphurous acid.

The above reactions refer only to dilute solutions as indicated in the paper; very different results would be obtained with either stronger reagents or stronger solutions. The average temperature throughout these experiments was about 26°.

The following is a convenient reagent for detecting nitrites or nitrates:—Dissolve 2·5 grams of orcinol in a mixture consisting of 25 cc. of 2 per cent. copper sulphate solution, 1 cc. of pure sulphuric acid, and 25 cc. of pure 15 per cent. hydrochloric acid, and filter; 2 drops of this are added to 0·5 cc. of the solution to be tested, and 2 cc. of sulphuric acid run in. If the reaction, as already described above, occurs in presence of sulphurous acid, nitrates are present.

Griess' Sulphanilic Acid Test for Nitrous Acid.—The author takes 5 cc. of nitrite solution, adds 1 drop of a saturated solution of sulphanilic acid in 1 : 5 sulphuric acid, 1 drop of phenol or thymol, and after 10 minutes mixes well with 1 cc. of ammonia. Thymol gives an orange-yellow not so defined as phenol. The limit of this method, using 5 cc. of solution, is 1 part of N_2O_3 in 10,000,000 of water. The author suggests the use of the method in the reverse order as a test for phenols. Orcinol gives as good a reaction as phenol, but becomes colored of itself on exposure to the air in presence of alkali, and is therefore untrustworthy.

VAPOR-DENSITY OF CHLORINE AND FERRIC CHLORIDE.[1]

By C. Friedel and J. M. Crafts.

The authors have previously shown that the vapor-density of aluminium chloride is constant between 288°, and 400°, and corresponds with the formula Al_2Cl_6. Deville and Troost's experiments with ferric chloride gave results corresponding with the formula Fe_2Cl_6, but the later determinations of V. Meyer and Grünewald have shown that between 440° and 1300° the vapor-density is always lower than that corresponding with Fe_2Cl_6, and agrees more nearly with the formula $FeCl_3$. There is always, however, a want of agreement between the observed and calculated values, because at temperatures above 518° the ferric chloride decomposes into ferrous chloride and chlorine. The authors point out that Meyer's results do not agree at all well with the formula $FeCl_3$, and consider that above 750° the ferric chloride dissociates into Fe_2Cl_4 and Cl_2, whilst the further reduction of density observed above 1052° is due to the partial dissociation of Fe_2Cl_4 into $2FeCl_2$. The boiling point of ferrous chloride and its vapor-density are, however, not yet known.

The modification of Dumas' apparatus employed by the authors makes it easy to ascertain whether dissociation has taken place and any crystals have been deposited. They find that, contrary to the statement of Meyer and Grünewald, ferric chloride in an atmosphere of nitrogen is dissociated into chlorine and ferrous chloride, the latter being deposited in almost colorless crystals which do not recombine with the liberated chlorine on cooling, nor after remaining in contact with it at the ordinary temperature for several days. The ferrous chloride is not volatile at 440°, and hence the volume of gas in the apparatus is not altered in consequence of the dissociation.

In order to prevent the dissociation, the apparatus was filled with chlorine, and hence it became necessary to determine the relative density of this gas at the temperatures employed. The chlorine was made in some experiments from manganese peroxide and hydrochloric acid, in others from potassium dichromate and hydrochloric acid, and was dried by means of sulphuric acid. The following results were obtained:—

Temperature.....	19·7°	21·6°	23·0°	356·9°	440·0°
Sp. gr.....	2·479	2·458	2·475	2·451	2·448

[1] *Compt. rend.*, cvii., 301–306; reprinted from *Jour. Chem. Soc.*, 1888, p. 1251.

Between 21° and 357° the coefficient of expansion of chlorine is to that of air as 1·009 : 1·000.

The experiments with ferric chloride were made in the same way as those with aluminium chloride. Relatively low temperatures were employed, and the quantity of the salt used was such that chlorine was always present in considerable excess. The ferric chloride volatilized completely and not a trace of ferrous chloride was formed. Ferric chloride boils at 280—285°, and melts under pressure at 301°. The following results were obtained:—

Temperature.....	321·6°	325·2°	356·9°	357·0°	442·2°	442·2°
Vapor-density.....	11·41	12·47	12·04	11·85	11·66	11·30

Between 321° and 442° the vapor-density is practically constant, and corresponds with the formula Fe_2Cl_6.

NOTE ON SYRUPUS CROCI.

By C. J. S. Thompson.

Although saffron is not now regarded of much value as a therapeutic agent, the syrup is still frequently used and prescribed in medical practice of to-day, in many parts of the country. The official tincture, which is presumably retained in the Pharmacopœia on account of its coloring properties, is very seldom used, but there seems to be a want of a good formula for the preparation of a satisfactory syrup.

A century or more ago saffron occupied an important position in the Pharmacopœias of the countries of Europe, and was considered useful as an emmenagogue, and also for its stomachic and antispasmodic properties, doubtless due to the action of its volatile oil.

We meet with it in the form of aqueous and alcoholic extract, infusion, spirit, aqueous and vinous syrup, tincture and wine. When prepared in the usual way by means of sugar simply dissolved in a watery infusion, the product does not keep satisfactorily, and does not long remain bright and clear. The following formulæ, taken from several old Pharmacopœias and Dispensatories, are interesting:—

No. 1. (German)—

℞ Saffron.....1 oz.
Boiling water.....1 pint.
Refined sugar.....2½ lbs.

Macerate the former in a covered vessel for twelve hours, then filter the liquid, and form a syrup with the sugar.

No. 2. (1720)—

℞ Oriental saffron ..... ℥vj.
Boiling water ..... ℥x.

Infuse for three days in a closed vessel, express, and dissolve in the infusion—

White sugar ..... 1 lb.

No. 3. (Van Mons)—

℞ Saffron ..... 1 part,
Water ..... 8 parts.

Infuse for six hours in a water-bath and express; again infuse the residue in water, 8 parts, mix the two strained infusions, and add—

White sugar ..... 28 parts.

and make a syrup.

No. 4. (France)—

℞ Croci ..... 1 oz.
Vin Malaga ..... 1 lb.

Macerate for two days, then express lightly; set the liquor aside, decant and add—

Sacch. alb. ..... 1 lb. 10 oz.

make a syrup.

The following formula can be recommended as producing an excellent syrup of good color:—

℞ Saffron ..... ℥iij.
Boiling water ..... ℥x.
White sugar ..... 1½ lb.
Rectified spirit ..... ℥iss.

Infuse the saffron in boiling water for six hours and strain; set aside till cold, then heat to the boiling point and filter. Dissolve the sugar in the filtrate by means of gentle heat, and when cold add the rectified spirit. The product will be found to keep well, and remain bright and clear without precipitating.—*Phar. Jour. and Trans.*, January 5, p. 526.

Zinc cyanide is recommended by Dr. Laschenwitsch (*Jour. de Méd.*) in certain affections of the heart, and seems to be particularly valuable in cases where digitalis, convallaria, etc., irritate the digestive organs. The dose is from five to six milligrammes in the twenty-four hours. The salt must not be confounded with the ferrocyanide, which is probably useless for the above purpose.

LINIMENTUM OPII AMMONIATUM.

By M. Conroy, F. C. S.

This liniment, according to the recent edition of the B.P.C. Formulary, is made by mixing together 6 fluidounces each of soap liniment, compound camphor liniment and tincture of opium, and 1 fluidounce each of liniment of belladonna and stronger solution of ammonia, with directions to "mix, and after standing a week, filter quickly;" while in the first edition of the Formulary the directions to the same formula were simply "mix and filter." When made by this latter plan I have invariably noticed that a crystalline deposit takes place after a few days' rest, from which it would appear that the object of the instructions contained in the last edition of the Formulary is to allow this separation to take place before filtering. This crystalline deposit resembles morphine very much, and as 20 fluidounces of the liniment contains 6 fluidounces of tincture of opium, equivalent to 198 grains of powdered opium or to 19·8 grains of morphine, it seemed very probable, considering the presence of caustic ammonia, that morphine would crystallize out. With the object in view of determining the nature of the deposit, I sealed up a bottle last May, made to the directions of the old Formulary, by simply mixing and filtering right off, and did not open it until yesterday. This bottle contained 20 fluidounces, and after syphoning off the clear liquor, the crystalline deposit was thrown into a small filter, drained, and freed from adhering liniment by washing with a little proof spirit. After drying at 212° Fahr. the weight was found to be only 2·1 grains, and I was somewhat surprised to find that the crystals were not morphine, nor did they even yield a trace of morphine to the usual delicate tests for that alkaloid. They were only very slightly soluble in water, and the solution gave a white precipitate with barium chloride insoluble in nitric acid. Heated to redness on platinum foil, a slight charring occurred, due probably to extractive matter, as the crystals were of a yellow color, and a white ash remained, which was nearly all soluble in water. This solution gave the violet potassium flame test, and a little of the solution placed on a watch glass, with a drop of solution of platinic chloride, gave a small crop of crystals on standing a few hours. There were also very slight traces of calcium and of meconic acid. This result, I must confess, came to me as an agreeable surprise, for I have looked upon this liniment since its introduction as an incompatible mixture; but it is very

evident from this that the solvent action of the alcoholic medium is quite sufficient to hold the morphine in solution. Although these results are of a negative character, they are well worth recording, as no doubt others have observed this crystalline deposit and have possibly come to the same conclusion as myself, and they also show that the Formulary Committee have been well advised in directing the liniment to stand a week before filtering.—*Phar. Jour. and Trans.*, Dec. 1, p. 442.

RÉCAMIER TOILET POWDER.

"Guaranteed free from lead, bismuth and arsenic. The finest powder ever manufactured. Will not make the face shine."

Sample packages of this powder have been distributed by mail. A chemical and microscopical investigation of the preparation shows its composition to be oxide of zinc mixed with starch.

C. B.

PHOTOGRAPHY.

By F. V. Butterfield.

(*Continued from page* 48.)

The result of all this work is a negative, from which as many copies as required may be taken by the process of printing. The conventional term "negative" may possibly puzzle some, so I will just explain *en passant* that it is so called in contradistinction to a "positive," which is a picture in itself, whilst a "negative" is only the means of making one; in the latter all the lights and shades are reversed; it is always examined by transmitted light, the former by reflected light.

As stated in a previous portion of this paper, wet-plate photography seems well adapted for taking "positives," and the peripatetic photographer, a well-known character in all popular places of resort, does not by any means lose sight of this. Another common form of the collodion positive is the ferrotype, possibly familiar to you under the name of "American Gem" portraits, the only difference being in the substitution of a thin sheet of enamelled iron for the ordinary glass plate.

The gelatin-bromide process is similar in principle to the above, but here gelatin is used in the place of collodion for holding the sensitive silver salts *in situ*, the advantage being that the plates can be prepared a great length of time before using; and also after exposure, they may be kept for a lengthened period, prior to development, a fact of no little importance, when on a tour abroad, for instance; but the most striking feature in connection with its use is that the gelatin in some way or other appears to act

splendidly as a most energetic sensitizer, so that the part it plays may not be entirely mechanical, and thus the slowest gelatin dry plate on the market is twenty times more rapid than the old wet-plate, whilst those devoted to instantaneous work are about sixty times more sensitive.

The preparation of these plates requires special apparatus, and as they can now be bought so very cheaply, it would not repay an amateur to make them, so, having obtained a supply, the next step is to draw on them a picture by the aid of light, or in other words, to take a photograph.

Now a ray of ordinary light can be split up by dispersion into a series of different colors, commencing with red and ending in violet, the latter being the most refrangible, the former least so, and the spectrum so obtained also possesses three different properties, calorific, illuminating and chemical. The heating effects reside chiefly in the red rays, illuminating in the yellow' whilst the violet and some still more refrangible or ultra-violet rays constitute the chemical or actinic properties, and it has been proved that the decomposition of silver salts by light is almost entirely due to these actinic rays. Thus we are enabled to do all our work, such as preparation of the plates, development, etc., with impunity in a deep ruby light, which has no palpable effect on the most rapid gelatin. But it will now also be apparent to you that it is no easy matter to take a good photograph of, say, a fair sitter, possessing lovely blue eyes and red hair, or an individual furnished with a liberal supply of yellow freckles, or say, a painting where all the varied colors of the spectrum are blended together in one harmonious whole; but for work of this sort special plates are prepared called "orthochromatic," in which the sensitive film is stained with some aniline dye; an ammoniacal solution of eosin or tetrabromfluorescein has been found to answer extremely well, and plates prepared with it are the subject of a patent.

Any object which reflects yellow or red, will appear almost black when reproduced by photography, whilst any shade of blue is almost equivalent to white. These facts must be borne in mind when calculating the time requisite in exposure.

The lenses employed must, of course, be rendered achromatic. This is easily effected by a combination of flint and crown glass, but, as they can not be entirely freed from spherical aberration, we are obliged to use diaphragms to cut off the outer rays, in order to obtain pictures sharp and crisp all over.

Cameras are made in a variety of shapes and sizes. With regard to the latter I recommend the half-plate size, as it is not too cumbersome to become a nuisance when touring, and enlargements can be easily made on the "bromide" paper sold for the purpose, if required. The shape should be square, having a reversing frame, swing back and rising front. The first is very useful, from the fact that we can take a photograph, with the plate held in either a horizontal or vertical position, instead of having to alter the position of the camera as of yore. The swing back is brought into play, whenever it is necessary to tilt the camera, serving to keep the plate as nearly as possible in a perpendicular plane, whilst the rising front will some-

times obviate tilting the camera, etc. The bellows should be extensible to twice the focus of the lens, so that the camera may be also used for copying other photographs, etc.

Three double backs are usually provided with each camera. These are light-tight, and the first operation is to fill them with the dry plates. This, as I explained, must only be done in a non-actinic medium. If a proper dark room cannot be fitted up, the darkest place possible should be secured, and all work, such as development, etc., always reserved till night, when by the aid of the ruby lamp there is no difficulty whatever. The packet of quarter plates is then opened in this red light, and carriers are provided to enable the half plate dark slide to be used for any smaller plate; so the quarter plate having been placed in the rabbet of the "carrier," film side down, and secured, the camera is next mounted on its tripod stand.

Portraits require some experience in "lighting," posing, etc., before they can be taken at all satisfactorily; it is better to commence, therefore, with some simple object, such as a building. Having taken up some coign of vantage uncap the lens, and with the cloth drawn over your head to keep out extraneous light, proceed to focus. Owing to the rectilinear propagation of light the image of the object of course appears upon the screen in an inverted position. In a portrait it is usual to focus the eyes of the sitter only, but for a landscape generaliy the foreground, in order to get the effect of distance, whilst the arrangement of the picture itself will call into requisition your artistic tastes and abilities.

Having thus got the object into as sharp focus as possible, by means of the rack and pinion adjustment, recap the lens, withdraw the screen, and in its place insert the dark slide containing the gelatin dry plate. Now comes the most important operation, that is, *exposure*. No hard and fast rule can be given for this, it is gained only by experience and practice: with an ordinary dry plate, doublet lens, and nicely diffused light, two to three seconds may be considered the average time to give, but on this occasion only draw out the shutter of the dark slide to one-third its length and give one second; then draw it out another third, being careful not to disturb the position of the camera, and give another second; finally, expose for one second more when drawn out to its full extent.

There will thus be, on that one plate, the results of three exposures of one, two and three seconds each.

The next step is the *development* of the photograph. For this purpose many different solutions have been suggested and used from time to time, but the one I always use recommends itself for simplicity, and has the great advantage of working well with almost any maker's plate. One has, moreover, considerable control over it during development, its action being easily modulated to suit either "over" or "under"-exposed plates.

℞ Am. bromid. . . . . 3ss.
Liq. am. fort., .880 . . . . . 3j.
Aq. ad. . . . . 3x.
Misce.

For a quarter plate take 1 ounce of the above, and immediately before

using add to it 2 grains pyrogallol; for a half plate use, of course, just double the amount.

The reason for adding the "pyro" at the last moment will be obvious, being simply because its alkaline solution so rapidly absorbs oxygen from the air, that it is soon rendered useless as a "developer." Sulphites have been used to prevent this, but it is really very little trouble to add the pinch of "pyro" at the last moment.

Developing solutions containing pyrogallol have a nasty habit of staining everything, linen, hands, etc., with which they come in contact, said to be due to the formation of metagallic acid, and recently Capt. Abney has suggested the substitution of hydroquinone for it. These bodies are closely related chemically, the former being, of course, trihydroxybenzene $C_6H_3(OH)_3$ and the latter dihydroxybenzene $C_6H_4(OH)_2$. In the reaction during development the latter is simply oxidized to quinone, which crystallizes in light yellow crystals, and is thus devoid of this evil habit of discoloring everything.

$$C_6H_4(OH)_2+O=\underset{\text{Quinone.}}{C_6H_4O_2}+H_2O,$$

but it does not appear to answer the purpose quite so well as the former.

Hydroxylamine hydrochlorate $NH_2OH.HCl$ has also been pressed into the service of photography, in this capacity, but during the process of development, nitrous oxide gas N_2O is liberated, causing little cracks in the film, and the potassium, or sodium hydrate, which must necessarily be used with it, has a softening action on the gelatin. Its mode of action is perhaps expressed by the following equation:

$$4Ag_2Br+2NH_2OH.HCl+6NaHO=$$
$$8Ag+4NaBr+2NaCl+7H_2O+N_2O.$$

Another developer, very largely used, is one with ferrous oxalate, made by adding large excess of neutral potassium oxalate to ferrous sulphate,

$$K_2C_2O_4+FeSO_4=FeC_2O_4+K_2SO_4.$$

In the process of development the ferrous salt is raised to ferric at the expense of the silver salt, which is reduced to the metallic state, forming the image, thus—

$$6Ag_2Br+6FeC_2O_4=12Ag+Fe_2Br_6+2Fe_2(C_2O_4)_3.$$

And so we might go on enumerating the different developing solutions, each having its own supporters, who laud the virtues of their own particular "developer" sky-high; but, as I said before, let the amateur stick to the alkaline pyro-developer, and first thoroughly master the action of that. He can then afterwards try the others, and decide the matter to his own satisfaction. In this developer the ammonia acts as an accelerator, the bromide as a restrainer, whilst the pyrogallol is the reducing agent; therefore, if we have reason to believe, prior to development, that the plate was slightly *over* exposed, we must add a little more bromide to the developing solution, or if *under* exposed, a drop or two of the strong liquid ammonia ·880.

It will appear from the above equations that the chief action of the developing solution is to rob the silver salt of its halogen, and thus reduce it to the metallic state, it having first of all undergone some change by the action of the light, whereby its affinity for the halogen is in some way or other impaired, and rendering it thus more easily reduced. This reduction must take place in a very gradual manner indeed, or the resulting negative would otherwise be very harsh and utterly devoid of that beautiful gradation and softness so necessary for the production of a good print; hence the use of a bromide in the developer, although *how* it acts as a restrainer is not exactly known, but it appears in some way or other to assist the silver bromide in resisting the action of the developer.

Some pyro developer having been made, as soon as night sets in again light the ruby lamp, and take the plate on which the three exposures were made out of the dark slide. On looking at it no apparent change has taken place; it appears precisely the same as when first put in; but if the instructions given have been strictly followed a faithful representation of the subject lies latent on the correctly-exposed part, and the next step is to make it visible. Placing the plate in a small dish or tray, film side up, pour on the developer evenly, gently rocking the dish to and fro during the whole time. Now, supposing two seconds to have been the *correct* exposure, then the portion of the plate which received *three* seconds will rapidly flash out, whilst the two seconds part gradually unfolds itself, first the high lights, as sky, white objects, etc., and then the detail in the more shaded parts, whereas on the portion exposed for one second only it will be some time before any change at all is perceptible, then, very slowly indeed, the high lights will become visible, but there will be no detail whatever.

In practice, therefore, as soon as the plate has been flooded with the developer, it is a very easy matter to tell whether the exposure has been correct or otherwise.

As soon as it is thought that all the detail is well out the plate must be rinsed in a little clean water, and put into the fixing bath, which is another dish containing a solution of sodium thiosulphate.

℞ Sod. thiosulph. . . . . ʒiv.
Aq. ad. . . . . Oj.
Misce.

Immediately the creamy appearance (due to the unaltered silver bromide) observed at the back of the plate has entirely disappeared this operation is complete, and it only remains to thoroughly wash the plate in order to remove all traces of "hypo," and place it in a rack to dry. The result is a negative, and from it as many copies as desired may be taken by one of the many different processes of "printing;" for instance, it can be done either in silver, platinum, uranium, iron, or chromium salts, but as the first-mentioned is the oldest and most popular to-day, I shall confine my remarks to that.

(*To be concluded.*)

VARIETIES.

Helleborein as a local anæsthetic.—Venturini and Gasparini (*Internat. klin. Rundschau*), found by experiments on rabbits and dogs, that instillations of weak solutions of helleborein ($\frac{1}{70}$ gr. per drop) into the conjunctival sac cause after about 15 minutes anæsthesia of the cornea; half an hour after the first application the first signs of returning sensibility appear. Pupil, eyelids, acuteness of vision, intra-ocular pressure, remain unaffected; no symptoms of irritation are observed. *Extract of Strophanthus*, too, is said to possess anæsthetic properties.—*Med. Chronicle*, Nov. 1888.

Saccharin used in place of cane sugar.—R. Kayser found glucose and saccharin—but no cane sugar—in four samples of raspberry syrup, in five liqueurs and in six samples of candy. Starch syrup sweetened with saccharin has likewise been observed. To detect the adulteration a few drops of diluted sulphuric acid are added to the substance, if necessary triturated with water; the liquid is then agitated with a mixture of equal parts of ether and petroleum benzin; the residue left on evaporation is dissolved in a little warm water, and tested for salicylic acid, and by its intensely sweet taste for saccharin.—*Chem. Repert.* 1888., p. 101.

Chromic Acid in Excessive Sweating.—A circular has been sent to the Prussian Army medical officers, advocating chromic acid as an economical and efficient means of checking excessive perspiration. In hyperhidrosis of the feet the application of a ten per cent. solution, repeated every three or six weeks, is sufficient to prevent any inconvenience from this source.—*Medical Press; Med. News, Nov.* 17, 1888.

Liniment for Burns.—As an application for burns, the *Centralbl. für Therap.* suggests the following:

℞.—Ol. olivæ.....6 parts.
Salol.....1 part.
Aquæ calcis.....6 parts.—M.

Med. News, Nov. 24, 1888.

Incompatible antiseptics.—The *Journal de Médecine* directs attention to the following incompatibilities: Corrosive sublimate and iodine; corrosive sublimate and soap; soap and iodine; carbolic acid and iodine; carbolic acid and permanganate of potassium; salicylic acid and soap; salicylic acid and permanganate of potassium; permanganate of potassium and oils, soap or glycerin.

Hydrochlorate of Apomorphine was employed by Dr. Stocquart, of Brussels, in coughs characterized especially by frequency and difficult expectoration. The dose is only three or four milligrams, dissolved in water, in the twenty-four hours. It is advisable to add a few drops of hydrochloric acid to the solution, as it is liable to rapid alteration; the acid does not affect its therapeutic value.—*Journal de Médecine.*

Meco-narceine a New Hypnotic.—Dr. Laborde reports in the *Bull. de l' Acad. de Méd.*, that in conjunction with Dr. Duquesnel he has obtained from opium a new alkaloid to which he has given the name of méco-narceine. He claims for this preparation, that it produces a quiet sleep, only slight

contraction of the pupils, slight anæsthesia, no headache, and no disturbance of the digestive tract.—*Med. News*, December 8, 1888.

Myrtol.—Dr. Eichorst recommends the internal administration of myrtol to overcome putrefactive processes of the air-passages. It is administered in two grain capsules, two of which are taken every two hours. It can be continued for weeks without causing any bad after-effects. Not only does it ameliorate the gangrenous odor of the expectoration, but diminishes also the quantity of the expectorated material. It does not stay the progress of the tuberbulosis.—*Med. News*, Dec. 29; see also AMER. JOUR. PHAR., 1886, p. 299.

Benzoated Chloroform.—Dr. B. W. Richardson recommends the use of benzoated chloroform as an antiseptic of considerable service in the treatment of fœtid wounds. It is made by dissolving three drachms of pure benzoic acid in twelve ounces of chloroform, and filtering if necessary. After the bandage has been applied a fluid drachm of the solution is poured over or near the ulcer, the deodorizing effect being of the best character. The solution is also effective for removing the fœtor in troublesome cases of fœtid exhalations from the feet; and used like eau de Cologne, it is advantageous to rub over the hands at a post mortem examination, and for similar purposes where a disinfectant is required.—*Asclepiad*, Vol. v. No. 10.

Action of Antipyrin on the Teeth.—Dr. Galippe, a dentist, finds that antipyrin taken internally has the effect of blackening the teeth. Teeth which, previous to the administration of this drug, had lost their enamel, blackened sooner than otherwise healthy teeth. The discoloration is only temporary as it can be removed by cleansing the teeth with water containing an abundance of oxygen.—*Deutsche med. Woch.; Med. News*, Dec. 8, 1888.

MINUTES OF THE PHARMACEUTICAL MEETING.

JANUARY 15th, 1889.

The meeting having been called to order, Wm. B. Webb, Ph. M., was asked to preside.

The minutes of the last meeting were read and no corrections being required they stand approved. Donations to the library being in order, the Year-book of Pharmacy for 1888, was presented; this book is a resumé of the state of pharmacy, issued by the British Pharmaceutical Conference and bears much the same relation to the British Conference that the report on the progress of pharmacy does to the Proceedings of the American Pharmaceutical Association.

Professor Maisch presented to the cabinet of the College a specimen of *Mezereon root*; in some parts of Europe the bark of the root is preferred, but that in the market is nearly all obtained from the stem.

Professor Maisch exhibited specimens of *white seneka root*, which had been recently sold in New York as true senega; he stated that some years ago this root was quite common in the market and that he believed it to be obtained from Polygala Boykinii, but that he had been unable to ascertain the locality of its collection, though on a former occasion the commercial article had been traced to Southern Missouri.

Mr. McIntyre called attention to the fact that the *tar* usually supplied to the trade now is quite different from that of old time pharmacy; it is put up in tins and labelled "steam refined tar;" the odor is much the same, but it will not mix with fatty bodies, shows whitish specks through the mixture and when strained it clogs the strainer. Mr. Meyer stated that he had the same experience as Mr. McIntyre; inquiries about the origin showed that the tar now sold usually comes from North Carolina, but formerly the supply was from New Jersey; a city firm which sells it largely refused to give any satisfactory information in regard to its origin or manufacture. Most of that which is put up now in cans bears the label of James Good, and different jobbers seem all to be supplied with the same article: formerly it came in small kegs of about one or one and a half gallons. It was suggested to refer this subject to a committee to report at a future meeting.

Professor Maisch read a paper upon *Mistura Glycyrrhizæ Composita* by J. Harry Buckingham, Ph. G.

Mr. McIntyre in noticing the paper said that he would hesitate about using ammonia as it altered the character of the preparation by neutralizing the free acids, and further that attempts to improve the appearance had not given much satisfaction as customers were used to a muddy, brown looking preparation instead of a clear, deep red article.

F. X. Mœrk read a paper upon "Tests for *Oil of Cotton Seed.*" In the discussion which followed it was stated that *oil of ben* was not the same as sesamum, but was an abbreviation of behen, which was a species of moringa.

Mr. Beringer said he had used a mixture of fuming nitric and sulphuric acids and water as a test, Bechi's test contains amylic alcohol and rape-seed oil with nitrate of silver; but it has been proven that amylic alcohol is not essential to the test. The opinion was freely expressed that most of the commercial olive oil contains cotton-seed oil, and perhaps other bland oils, like rape-seed and mustard-seed oils which were formerly mixed with olive oils. One of the members present who was formerly largely engaged in the manufacture of lead plaster said that at one time they were very much troubled with olive oil that would not yield a satisfactory plaster, that partial saponification seemed to take place and some principle was present which left the plaster sticky.

Prof. Maisch read a paper upon the *Soluble Gum of Tragacanth*, which was elicited by some queries which pointed to a difference between the statements of the Pharmacopœia and of other works. Dr. Lowe said he had tried these experiments and could confirm them.

The above papers were referred to the Publishing Committee.

The question about tar was referred to Dr. Lowe, who promised to report as soon as possible, though probably not at the next meeting.

Mr. Webb said that for preparing *Ointment of Tar*, he had been in the habit of using about one part of wax in twelve parts of the ointment, which gave a better consistence. There being no further business, on motion adjourned.

T. S. WIEGAND,
Registrar.

EDITORIAL DEPARTMENT.

The Meeting of Pharmacists on the Pacific Coast.—When the American Pharmaceutical Association, at its meeting in Detroit, resolved to meet this year in San Francisco, a committee was appointed to select a suitable date and to make the necessary traveling arrangements. About the middle of January the committee announced July 15th next as the date for the beginning of the meeting; but subsequently reconsidered this action, and fixed upon Monday, June 24th, for convening the meeting. It must be expected that the convenience of every member could not be secured by the selection of any date; but it is to be hoped that the day, now finally agreed upon, will suit a very large number of those intending to be present, and that those who for various reasons would have preferred a later date will use their best endeavors to make their convenience suit the date.

In a short time the committee will announce particulars as to the traveling arrangements made for the accommodation of the members and their friends.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Angewandte Pflanzenanatomie.—Ein Handbuch zum Studium des anatomischen Baues der in der Pharmacie, den Gewerben, der Landwirthschaft und dem Haushalte benutzten pflanzlichen Rohstoffe. Erster Band. Allgemeiner Theil, Grundriss der Anatomie. Von Dr. A. Tschirch, Docenten der Botanik an der Universität Berlin. Wien und Leipzig: Urban & Schwarzenberg, 1889. Large 8vo., pages xii. and 548.

Applied vegetable anatomy. A hand book for the study of the anatomical structure of the vegetable raw material used in pharmacy, the arts, in agriculture and in the household. First volume. General part. Outlines of anatomy.

In our volume for 1885 (page 637) we noticed Professor Flückiger's "Principles of Pharmacognosy," and in that for 1887 (page 219) a translation by Professor Power of the same work, for the second edition of which the part relating to the morphology and anatomy had been especially prepared by the author of the volume now before us. While the former work was written with the special view of its application to drugs, the field of the present one is much larger, as indicated in the title, though the aim of the two works, in relation to anatomy, is substantially alike, except that the present one enters more into the details of the rich results of the researches by numerous scientists. The work is not intended as a text-book for the study of vegetable anatomy as such; but it aims at imparting the theoretical knowledge required for the successful practical application of the microscope to the investigation of vegetable substances for other than strictly botanical purposes. This object has been faithfully kept in view in restricting as much as possible the discussion of subjects, which are of importance to the botanist, but have little significance for practical application; and in extending the descriptions of anatomical elements of practical importance considerably beyond the necessities of the botanist. This practical object resting upon the broad basis of science is also noticeable in the

numerous wood cuts, of which the volume contains 614, every one of which is artistically executed, and with very few exceptions, illustrates some portion of a drug or of material used in the arts.

Aside from the introductory portion giving also the microchemical reagents, the methods of preparation, apparatus, etc., the work is divided into two parts treating respectively of the cell and of the tissue systems. The first part occupying a little less than one half of the book is again divided into two sections, of which the first treats of the cell contents, taking up the formless nitrogenated contents, protoplasm, then the nitrogenated contents having a distinct shape (nucleus, aleuron, chromatophores), the non-nitrogenous contents (fat, starches, salts) and the cell sap with its organic and inorganic constituents. The second section treats of the cell wall, its morphology, optical behaviour and chemical nature, followed by brief chapters on cell formation, cell forms and cellular tissue.

The second somewhat larger part is entitled "Anatomic-Physiological Systems," and is subdivided as follows: 1. meristemes; 2. epidermal system including trichomes and cork; 3. mechanical system (bast, libriform, collenchyme, sclereïds); 4. absorption system (roothairs, haustoria, mycorhiza); 5. assimilation system (palisade cells, leaf structure); 6. conducting system (ducts, tracheids and conducting parenchyme as the elements for conveying water; sieve tubes with the accompanying cells, cambiform, milk tubes and conducting parenchyma as the elements for conveying plastic material; the different kinds of fibro-vascular bundles and the endoderm; then the secondary growth in thickness, including bark, wood, etc.,); 7. ventilating system (intercellular spaces, stomata, lenticels); 8. storage system (storage organs and reserve material); 9. secretion and excretion system (glands, and resin-,oil-,mucilage-,etc., cells; schizogenic and lysigenic excretion receptacles, and laticiferous ducts).

The work is excellent in conception and execution, instructive and incentive, and of lasting value to students as well as to all those using the microscope for the examination of vegetable substances.

Universal-Pharmakopöe. Eine vergleichende Zusammenstellung der zur Zeit in Europa und Nord Amerika gültigen Pharmakopöen von Dr. Bruno Hirsch. Göttingen: Vandenhœck & Ruprecht.

Universal Pharmacopœia. A comprehensive comparison of the pharmacopœias at present in force in Europe and North America.

A universal pharmacopœia, intended to cover the wants of all civilized countries, would be a visionary undertaking; but in the present case the title is used in an entirely different sense, differing also from that of older works like those by Jourdan, Geiger and Mohr. While these authors based their works upon the pharmacopœias then in existence, they, at the same time, admitted also numerous drugs and galenicals not recognized by any pharmacopœia then in use, and their works must be regarded more in the light of comprehensive dispensatories, or of general repertories similar to that more modern and at the same time more national one by Dorvault, entitled l'Officine. But the work before us is intended to embrace only the phar-

macopœias now in existence, and to give the contents of each in such a manner that every subject and every detail contained in one or more of them can be readily compared, pointing out the differences in statements and requirements, and supplying criticisms based upon the author's extensive researches and practice. The work is therefore by far more than a mere comparison of different pharmacopœias; and while on the one hand it supplies the strongest arguments in favor of an "international pharmacopœia," with the view of securing unification in the strength of at least the important medicines, it likewise furnishes much valuable and useful material for the revision of the individual pharmacopœias.

The arrangement is strictly alphabetical the leading titles being those adopted by the German Pharmacopœia, or of an analogous nomenclature, in case the article be not recognized there; the titles adopted by other pharmacopœias are given as official synonyms. The text does not consist of mere abstracts placed side by side, but for each article has been moulded by the author into a continuate and homogeneous narration of all the statements or important directions given by the various authorities. Clear in diction, concise in statements, comprehensive in scope, mild but precise in criticism: the author presents a work which is a monument to his knowledge and zeal, and of inestimable value to the pharmacists of all civilized countries.

About two years ago the first volume was completed containing accounts of 1850 pharmacopœial drugs, chemicals and pharmaceuticals. For various reasons the printing of the second volume was delayed, but during the last five or six months, four parts of the second volume have been published, containing upon 368 pages nearly 900 different articles, the last one being No. 2374 "Pasta caustica." There will be no delay in the publication of the remainder, and the whole of the second and last volume is expected to be issued during the approaching spring.

The Art of Dispensing: A treatise on the methods and processes involved in compounding medical prescriptions. Published at the office of *The Chemist and Druggist*, London and Melbourne, 1888. 12mo. Pp. 280.

A very useful book which can be recommended and deserves to be consulted by dispensers. It begins with "general suggestions" to dispensers, discusses, "weights and measures," the relation of "prescribers and dispensers," "special drugs," etc., and then, proceeds to the consideration of the various classes of medicines, closing with chapters on incompatibles, dispensing foreign prescriptions, new remedies, homœopathic dispensing and illegible prescriptions. The practical aims of the author are obvious upon every page and as a rule the information and advice given are trustworthy. In some cases, however, we would differ from the author; thus we think that—in the United States, at least—aqua menthæ directed in prescriptions is intended for spearmint water, but not for peppermint water (p. 19.) To a mixture containing a bismuth salt and magnesia in water the addition of gum (p. 24) cannot be recommended; syrup or glycerin is preferable if not otherwise inadmissible. We regard the extemporaneous

preparation of aromatic waters from an alcoholic solution of the oil as justifiable if intended for immediate use, but not for large quantities (p. 33) to be kept in stock, because they soon turn acid. The powdering of quinine sulphate (p. 41) is of questionable utility, because it destroys the physical character of the salt, and renders it still more prone to loss of water of hydration. Silver nitrate dissolved in pure distilled water and kept out of contact with organic matter remains unchanged in the sunlight, and neither amber-tinted nor blue-glass bottles are necessary for the preservation of the solution. In the putting up of prescriptions doubtless many a dispenser would differ in the use of excipients, the order of admixture, etc.; but it must be remembered that there are usually more ways than one for accomplishing a given object.

The appendix contains a number of examination prescriptions, reproduced for practice by students, because they generally present special difficulties. Next follows a list of terms likely to occur in French and German prescriptions, and a list of abbreviations used in prescriptions, both being pretty complete. A full index of 14 pages in double columns facilitates reference to the different subjects.

The external appearance of the book in regard to paper, proof reading and printing is in keeping with its contents—commendable.

Handbuch der praktischen Pharmacie für Apotheker, Drogisten, Ærzte und Medicinal-Beamte. Bearbeitet von Prof. Dr. H. Beckurts und Dr. Bruno Hirsch. Zweiter Band. Stuttgart: Ferdinand Enke.

Handbook of practical pharmacy for apothecaries, druggists, physicians and medical officers.

In notices of the first volume of this work, contained in preceding volumes of THE JOURNAL, we have explained its scope, arrangement and general character. The two fascicles before us bring the second volume to page 192, commencing with No. 681 Faba Calabarica, and containing in alphabetical order nearly three hundred and fifty articles, the last one being No. 1028 Liquor Aluminii acetici. The same care and accuracy, noticed in the preceding volume, characterize also the text of the present numbers.

Pictorial History of Ancient Pharmacy, with sketches of early medical practice. By Hermann Peters. Translated from the German, and revised with numerous additions by Dr. Wm. Netter. Chicago: G. P. Engelhard & Co., 1889. 8 vo. Pp. 184. Price $2.

Mr. Peters' work attracted a good deal of attention in Europe as a most valuable contribution to the history of pharmacy; being written in the German language it was inaccessible to those not conversant with that tongue. We are glad, therefore, that through Dr. Netter's translation it has been rendered in English, retaining, as much as is possible in a translation, all the attractive quaintness of the original, and reproducing in a commendable manner its illustrations. But in order to render it more inviting in its new home the translator has amplified the text by the addition of many features of interest, without materially altering the style and arrangement. In this garb it will doubtless be consulted with great interest by pharmacists

and physicians as well, as by the student of history. As stated before the translation has been faithfully done, and the interpolated parts have been very judiciously incorporated. Perhaps it might have been desirable to indicate in the body of the work those portions which have been added to the original, in addition to the brief references made in the preface; and it would certainly not have detracted from the interest or value, if proper credit had been given in all cases. For instance, the account of Chinese pharmacy on pages 16 and 17 has been taken from the valuable paper contributed by Mr. Stewart Culin to the AMERICAN JOURNAL OF PHARMACY, and published in the volume for 1887, p. 593.

Aside from the shortcomings indicated we heartily recommend the work to our readers, feeling assured that its attentive perusal will not merely satisfy idle curiosity. The external appearance of the book—binding, paper and typography—is also quite attractive.

Year-book of Pharmacy, comprising abstracts of papers relating to Pharmacy, Materia Medica, and Chemistry, contributed to British and foreign Journals from July 1, 1887, to June 30, 1888; with the Transactions of the British Pharmaceutical Conference at the twenty-fifth annual meeting, held at Bath, September, 1888. London: J. & A. Churchill. 8vo.; pp. x and 505.

Proceedings of the American Pharmaceutical Association at the thirty-sixth annual meeting, held at Detroit, Michigan, September, 1888. Also, the constitution, by-laws and roll of members. Philadelphia: Published by the American Pharmaceutical Association. 8vo; pp. xii and 700. Also, The National Formulary. Pp. xii and 176.

Of these two valuable annual publications the former appeared about four or five weeks ahead of the latter, which will be issued during the first week of February. The volume of the Proceedings—without the Formulary—is nearly half as large again as the Year-book. The minutes and papers read cover in the former 196, and in the Year-book 156 pages, and the abstracts from Journals (Report on the Progress of Pharmacy), 405 and 249 pages respectively.

In relation to the Proceedings, it should be mentioned here that the Publication Committee has greatly reduced the price of the older volumes, and in addition thereto allows large discounts on these reduced rates when two or more volumes are ordered at the same time. It is hoped that many members will avail themselves of this offer for completing their sets of Proceedings, which, as works of reference, will always retain their value.

Chemical Lecture Notes.—By Peter T. Austen, Ph. D., F. C. S., Professor of general and applied chemistry, Rutgers College, and the New Jersey State Scientific School. New York: John Wiley & Sons. 1888. 12mo. Pp. 98. Price $1.

This is a rather unique little volume treating of various questions belonging to chemistry which often give more or less trouble to the student, and which are discussed and explained in a lucid manner adapted for the use of the average student. Amongst the subjects may be mentioned the follow-

ing, as showing the intention of the author: atoms, molecules, atomicity, valence, affinity, rests, acids, bases, salts, etc. A few headings are followed by blank spaces for notes by the student. The topics have not been arranged in any particular manner, but follow one another without any apparent order or relation. However the little book is a useful one in the direction indicated above; and we believe the author's hope to be well founded "that some of the subjects considered may prove of interest and of value to those students who study, not to pass, but to know."

Third annual Report of the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania. Transmitted to the Governor, December 3, 1887. Harrisburg, 8vo. Pp. 338.

This report has been published much more rapidly than its predecessor, which was noticed in our last number. Though the volume now before us is smaller, it has been prepared with like care, and contains some valuable contributions to sanitary science.

Dose and Price Labels of all the drugs and preparations of the United States Pharmacopœia of 1880, together with many unofficinal articles that are frequently called for as medicines or used in the arts. With an appendix containing a description of many of the new remedies lately introduced. For the use of Pharmacists, Physicians and Students. By C. L. Lochman. Third edition, revised and enlarged. Philadelphia: Dunlap & Clarke. 1889. Pp. 201.

The appearance of the third edition proves the practical utility of these labels, as we indicated on noticing the previous editions. The present one differs from the second edition mainly in the correction of a few typographical errors, and in making the formulas for unofficinal preparations correspond with those of the National Formulary, without, however, giving labels for all of the latter. More than forty new or recently re-introduced remedies—in addition to those contained in the second edition—are briefly described in the appendix.

Fitting Glasses.—A Manual for the use of Opticians, Jewelers, Druggists and others who sell glasses. Philadelphia: Jas. W. Queen & Co. 8 vo., pp. 96.

The object of the pamphlet is to give instruction as to the proper methods of fitting spectacles. The descriptions and instructions appear to be clear and precise, so as to be readily understood by intelligent persons, and the 47 illustrations serve materially in explaining the various details.

Proceedings of the National Wholesale Druggists Association, in convention at Saratoga, September 11–14, 1888. Geo. B. Bower, official stenographer. Minneapolis, 1888. 8 vo. pp. 240.

The volume contains, as usual, the minutes, discussions, reports, etc., and as a frontispiece has a very good portrait of the present president, Mr. Geo. A. Kelly, of Pittsburg.